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A NEW GENUS AND A NEW SPECIES OF ELMINAE (COLEOPTERA, DRYOPIDAE).

BY HOWARD E. HINTON, B.SC., F.R.E.S.
(Zoological Laboratory, Cambridge).

In this paper one new species of *Cylloepus* from Mexico is described, and a new genus is erected for *Elmis simplex* Darl. of Cuba. In addition, a few notes are given on the genus *Neoelmis* Musgrave. The writer would like to stress the necessity of figuring the genitalia of all new species of the genus *Cylloepus*, for in certain groups of the genus (as will be explained fully by the writer in a revision of this genus to appear at a later date) species which apparently cannot be separated on external characters exhibit striking differences in the structure of the male genitalia. The author is indebted to Mr. P. J. Darlington for the single specimen of *E. simplex* in his collection and to Mr. P. N. Musgrave for paratypes of the genotype of *Neoelmis*.

Cylloepus blairi Hinton, sp. n.

Male: Length 3 mm., breadth 1.2 mm. Subparallel, moderately convex. Clothed with fine, short (about 0.037 mm.), recumbent, brownish-testaceous hairs which arise mostly at intervals equal to about their own lengths; antennae (all specimens before me are badly rubbed) with a few equally fine but more erect hairs at apical angles of segments; apical portion of labrum with equally fine but much longer (often 0.06 mm. or more) hairs which are apparently confined to sides; beneath with the hairs generally finer and shorter but otherwise similar. Cuticle moderately shining and for the most part finely alutaceous; piceous to rufo-piceous; antennae, mouth-parts and legs paler rufo-piceous; tomentum of body cinerous with golden reflections.

Head on each side near anterior one-half of eyes with a feeble, scarcely noticeable, broad, oblique impression. Antennae as figured (text-fig. 3). Clypeal suture well marked; anterior margin of clypeus very broadly and very feebly arcuately emarginate; angle on each side obtusely rounded; sides feebly arcuate. Labrum broadly and feebly rounded in front, nearly truncate; anterior angles broadly rounded. Surface with the alutaceous microsculpture appearing con-

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THE
ENTOMOLOGIST'S
MONTHLY MAGAZINE

VOLUME LXXII
[THIRD SERIES, VOLUME XXII]

A NEW GENUS AND A NEW SPECIES OF ELMINAE (COLEOPTERA, DRYOPIDAE).

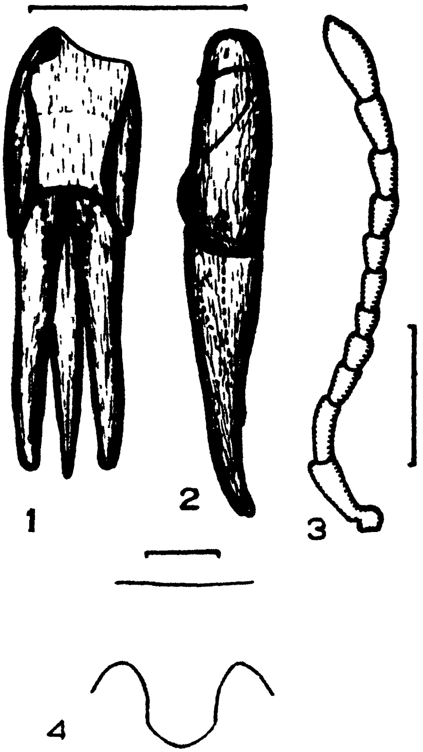
BY HOWARD E. HINTON, B.SC., F.R.E.S.
(Zoological Laboratory, Cambridge).

In this paper one new species of *Cylloepus* from Mexico is described, and a new genus is erected for *Elmis simplex* Darl. of Cuba. In addition, a few notes are given on the genus *Neoelmis* Musgrave. The writer would like to stress the necessity of figuring the genitalia of all new species of the genus *Cylloepus*, for in certain groups of the genus (as will be explained fully by the writer in a revision of this genus to appear at a later date) species which apparently cannot be separated on external characters exhibit striking differences in the structure of the male genitalia. The author is indebted to Mr. P. J. Darlington for the single specimen of *E. simplex* in his collection and to Mr. P. N. Musgrave for paratypes of the genotype of *Neoelmis*.

Cylloepus blairi Hinton, sp. n.

Male: Length 3 mm., breadth 1.2 mm. Subparallel, moderately convex. Clothed with fine, short (about 0.037 mm.), recumbent, brownish-testaceous hairs which arise mostly at intervals equal to about their own lengths; antennae (all specimens before me are badly rubbed) with a few equally fine but more erect hairs at apical angles of segments; apical portion of labrum with equally fine but much longer (often 0.06 mm. or more) hairs which are apparently confined to sides; beneath with the hairs generally finer and shorter but otherwise similar. Cuticle moderately shining and for the most part finely alutaceous; piceous to rufo-piceous; antennae, mouth-parts and legs paler rufo-piceous; tomentum of body cinerous with golden reflections.

Head on each side near anterior one-half of eyes with a feeble, scarcely noticeable, broad, oblique impression. Antennae as figured (text-fig. 3). Clypeal suture well marked; anterior margin of clypeus very broadly and very feebly arcuately emarginate; angle on each side obtusely rounded; sides feebly arcuate. Labrum broadly and feebly rounded in front, nearly truncate; anterior angles broadly rounded. Surface with the alutaceous microsculpture appearing confluently granulate; set with usually round granules which are about as coarse as facets of eyes and are separated mostly by one to two times their own diameters; granules on clypeus finer, middle apical margin nearly smooth and with a few fine punctures; labrum without granules, apical one-half punctate with fine punctures which are separated by one to two times their diameters.



(1) Dorsal view of male genitalia. (2) Lateral view of male genitalia. (3) Antenna. (4) Prosternal process. Lines next to figures represent a length of 0.2 mm.

Prothorax at broadest point near basal one-half broader than long (37 : 33) and base broader than apex (36 : 24). Apical margin when seen from above moderately arcuate and deeply sinuate on each side behind eye before apical angle; apical angles acute, moderately strongly produced forwards and slightly inwards; sides moderately arcuate, scarcely noticeably sinuate before basal angles, somewhat regularly, finely crenate; basal angles nearly rectangular, scarcely produced; base moderately strongly trisinuate, broadly so on each side and very shortly so in front of scutellum. Pronotum with the sublateral carina strongly prominent, slightly converging towards apex, feebly sinuate at basal one-third and again at apical one-third, complete from base to apical margin, very broad from basal one-third to apical one-third. Pronotum also sculptured as follows: a very broad and feebly raised portion extends from base in front of scutellum to base of disk; on each side of this raised portion with a feeble moderately broad, feebly curved and oblique impression extending to broad, moderately feeble, indefinite impression near basal sinuation of sublateral carina; median longitudinal impression beginning at base and ending at about apical one-half, throughout very shallow, broadest at basal two-fifths where it is as broad as scutellum. Surface with the alutaceous microsculpture similar to that of head; disk with the granules slightly coarser than facets of eyes but rather low (*i.e.*, not strongly convex) and usually separated by two to three times their diameters, though often, especially on apical portion of disk, more sparsely placed; granules on sides slightly denser but otherwise similar; granules on basal portion of sublateral carina slightly more convex and very slightly denser.

Elytra more than twice as long as prothorax (75 : 33) and very feebly broadened posteriorly to broadest point at apical one-third, which is broader than base of prothorax (49 : 36). Apices moderately produced, conjointly broadly and feebly rounded. Lateral margins moderately and regularly crenate. Discal surface rather coarsely striate basally, with the striae becoming finer towards apex and only very feebly impressed beyond apical one-third; discal strial punctures in basal one-half nearly subquadrate, deep, about as broad as intervals and usually separated longitudinally by little more than their own diameters, these strial punctures suddenly becoming nearly obsolete beyond apical one-half, at sides they are continued further towards apex. Discal intervals flat in apical one-half and (except sutural) feebly convex on basal one-half and moderately strongly convex at base, with the third slightly more convex than others; surface of intervals, especially at base, alutaceous somewhat similarly to pronotum; set with granules which are similar to pronotal ones but are more convex and on disk become much sparser towards apex; carinate lateral intervals with the granules similar but slightly denser. Scutellum flat, subovate, broader than sutural interval (4.2 : 3.5), longer than broad (5.2 : 4.2), feebly and broadly rounded at base and slightly narrowed to apex; surface sculptured similarly to adjacent portions of elytra but more sparsely granulate.

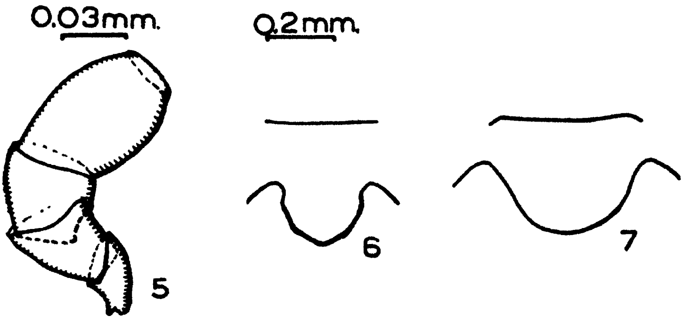
Beneath with the surface alutaceous as pronotum. Prosternal process as figured (text-fig. 4); middle area of prosternum feebly depressed, slightly rugose and obscurely granulate similarly to apical portion of pronotal disk; sides more evidently granulate; hypopleura sculptured similarly to middle area. Mesosternum with the cavity for the reception of the prosternal process broad and deep; surface sculptured similarly to middle area of prosternum but more densely granulate. Metasternum feebly depressed posteriorly; with a broad (about 0.025 mm. broad), deep, median longitudinal impression which ends abruptly at anterior one-fourth; on each side of middle near base with a broad, shallow, subtriangular impression; surface of disk set with round, rather convex granules which are distinctly coarser than facets of eyes and are usually separated by two times their diameters; sides similarly granulate but with the granules slightly less convex. Middle basal portion of first ventral segment moderately depressed, at base rugose and obscurely granulate, anterior portion with the granules about half as coarse as those of metasternum and usually separated by about five or more times their diameters; basal sides of first and middle portion of second and third segments similarly granulate; elsewhere on abdomen with the granules separated by two to three times their diameters. Femora and tibiae granulate similarly to abdominal segments; tibiae with no rows of teeth. Genitalia as figured (text-figs. 1 and 2).

Female: Externally similar to male.

Type: A male in the author's collection. MEXICO: Dist. de Temascaltepec, Tejupilco, alt. 3,900 ft., vii.1934 (*H. E. Hinton*).

Paratypes: 18, with same data as type; 2, collected at the same locality on 15.vi.1933 (*H. E. Hinton, R. L. Usinger*); and 6, MEXICO: Estado de Morelos, Cuernavaca, vi.1934 (*H. E. Hinton*).

Variations: The scutellum in some specimens is distinctly more narrowly obovate than that of the type. The depth of the pronotal depression near basal sinuation of sublateral carina is slightly greater in some specimens, and the median longitudinal pronotal impression in some specimens appears to begin at basal one-fifth. These variations are, however, scarcely worthy of mention.



(5) Maxillary palpus of *Xenelmoides simplex* (Darl.). (6) Prosternal process of *X. simplex.* (7) Prosternal process of *Xenelmis bufo* (Sharp).

Comparative Notes: Of the North American species, this can only be compared to *C. heterocerus* (Sharp), which it resembles in general shape, but from which it may be separated by the following readily observable characters: (1) the antennae are slightly longer and are entirely rufo-piceous instead of always having the apical segments piceous or at any rate darker than basal two; (2) the elytral intervals are subequally convex at base, the third being only slightly more convex instead of being very much more strongly convex than other discal intervals; and (3) the basal discal strial punctures are very coarse, being nearly as broad as intervals instead of seldom more than one-third as broad as in *C. heterocerus.*

Biology: Found on stones at both localities in small to moderately large fairly swiftly flowing streams.

The author takes great pleasure in dedicating this species to Dr. K. G. Blair, to whose generous and patient help he is much indebted.

Xenelmoides Hinton, gen. nov.

(Text-figs. 5 and 6.)

Elongate, subparallel. Head partially retractile; antennae elongate, narrowly linear, eleven-segmented; mandibles with three well-developed apical teeth, prostheca large, membranous, with about four fine, slightly more heavily sclerotized, apical teeth; maxillary palpi four-segmented (text-fig. 5). Pronotum evenly convex; without sublateral carinae; without impressions of any sort.

Elytra feebly striate punctate, granulate; each elytron with two sublateral rows of slightly larger granules, the inner row extending to about apical one-third and the outer row to about apical one-fourth. Scutellum moderately large, subovate.

Beneath with the prosternal process as figured (text-fig. 6). Metasternum with a median longitudinal impressed line. Tibiae with tomentum on inner apices.

Genotype: *Elmis simplex* Darlington.

The two elytral sublateral rows of granules are very feeble and scarcely noticeable when viewed under a magnification of 144. The new genus may be readily separated from *Stenelmoides* Grouv. by the very broadly separated instead of nearly contiguous antennal cavities and from *Xenelmis* Hinton by the entirely different form (*Xenelmis* being nearly round) and absence of distinct sublateral carina on elytra. The prosternal process is also distinct in both genera, though it is quite possible that intermediate forms will be found in this respect (*Xenelmoides*, text-fig. 6; *Xenelmis*, text-fig. 7).

Neoelmis Musgrave.

This genus has recently been described by Musgrave (1935, Proc. Ent. Soc. Wash., Vol. 37, 2) who has omitted stating in his description the presence of a sublateral carina on each elytron extending from base nearly to apex. Of the New World genera it is apparently most closely related to *Microcylloepus* Hntn., but the latter always has the basal portion of the disc with oblique impressions and the middle usually with a short median impression. Of the Old World genera it bears a very close resemblance to *Esolus* Muls., but this genus has not the strong transverse impression on apical one-half of the pronotum, and the structure of the mandibles is entirely different, being without teeth, whereas in *Neoelmis* the mandibles have three short apical teeth.

Besides the species listed by Musgrave as belonging to this genus, *Elmis simoni* Grouv. of Venezuela should be placed here.

Cambridge.
August 16th, 1935.

NOTES ON WASPS. (V.)

BY G. E. J. NIXON, B.A.

The following brief account describes the reactions of a queen of *Vespa vulgaris* L. towards an incipient colony of her own species with which she was brought into contact.

On June 7th, 1930, at Eynsford, in Kent, I discovered a nest of *V. vulgaris* in the ground. The queen was not at home when I dug it out, but I was able to catch her on her return. Two workers were already flying. During the process of taking the nest, the outer cover was completely broken off. The comb contained five cocoons and larvae in all stages of growth as well as eggs. I fixed it up in a darkened box with a little tube for ingress and egress and placed it in the summer-house to which I have referred in earlier notes.

The two workers both left on the following morning and found their way back satisfactorily. The queen was a very active creature and took a very great interest in her brood. She accepted eagerly a few ant-grubs which I offered to her, and from which I carefully removed the accumulated mass of excretory matter. Ant-grubs treated in this way were at once chewed up by the queen and fed to the grubs; but if I gave her a grub which had not been thus treated, she would at once seek to leave the nest through the tube. This I prevented, for I have repeatedly found that when a queen leaves her nest for the first time and under such conditions she fails to take her bearings properly and is unable to return. At 3 o'clock in the afternoon of the same day, the queen had not left her new home. At 9 o'clock she was absent and did not return that night, nor did she appear on the following morning, so that I gave her up for lost. She may have been disturbed when on the point of leaving or, what is more probable, may have carried out a dead grub—one of her own, which had been dragged previously from its cell and left beneath the comb—and, being thus burdened, would have been unable properly to register in her memory the environmental details of the new location of her home. I will now leave this nest for a moment.

On the morning of June 8th, I had seen a queen of *Vespa vulgaris* disappear into a hole in a rockery some twenty feet from the summer-house. From her somewhat unsteady flight, I judged that she had been working for some time and that her nest would be far advanced. On the following day, I dug it out—a beautifully constructed object, almost uniformly dark brown in colour, and containing larvae and six cocoons. I then removed from its box the nest discussed earlier and placed in its stead this new nest, into which I afterwards introduced the orphaned workers, now three in number. They were received with signs of excitement by the queen, who, incidentally, was quite faded and worn out with work; the yellow markings of her body were now dirty white. In the late evening of the next day, June 10th, this new queen was not within the nest, nor did she put in an appearance that night. On the following morning, at 6.15 a.m., I saw her fly heavily past her original nesting site in the rockery. At 9 o'clock she appeared again, flying over a pathway that skirted the rockery and searching, in what seemed rather an aimless manner, for the hole which she knew so well. I caught her and placed her on her nest, which she at once entered. She showed signs of being thoroughly exhausted. By means of soft clay I then narrowed down the diameter of the entrance tube so that only the workers could pass through.

During the following week, two workers hatched and a second comb was begun. For some days it consisted of only three or four cells, in each of which an egg had been laid. This nest could not, I think, have been successfully cared for by the three foster-workers and the two callows had it not been for the small tin-lid of syrup which was always kept within their reach.

On Sunday, June 15th, late afternoon, I captured a queen *vulgaris* in good condition close to the summer-house. I took her indoors and placed her on the remains of the original Eynsford nest, which now contained no grubs, for I had removed them, and from which one worker had emerged some hours previously and was resting lethargically on the four remaining cocoons. The queen appeared to take some interest in the comb but, before many minutes had passed, began to try to nibble her way out of the box. I then secured her in a glass tube and allowed her to enter the box containing the active colony in the summer-house. She at once made as though to enter the nest-opening, but on being violently repulsed by the workers she tried, evidently very much alarmed, to leave the box. I raised the glass and she slipped quickly out, flew straight for some ten inches and then turned, as though seized with a sudden thought, and carefully took her bearings. Although I waited for nearly an hour, she did not return that night.

On the following evening, I discovered a *vulgaris* queen—and I feel sure she was the one whose acquaintance I had made the previous day—resting motionless on the stick from which the nest hung and apparently observing it intently. I had removed the glass from the top of the box the night before. I captured her and brought her, together with the nest, indoors. When placed in the box, she would approach very close to the nest and stand facing it, her wings rapidly vibrating all the time. All the while, no workers appeared on the outside. I then removed the workers and the old queen and, after having stripped off a large part of the outer cover, placed the new queen on the comb, in which she showed enough interest to suggest that she would readily adopt it. This nest, of course, contained, besides cocoons, larvae and eggs and must have made a very different impression on her from that produced by the Eynsford comb. I am assuming and, all things considered, with justification, I think, that the queen was the same one in both cases. I now placed the old queen on the nest, and in the twinkling of an eye she rushed at the intruder and savagely attacked her. The scuffle took place in the corner of the box about a couple of inches from the comb and appeared to me to last only two or three seconds, the rightful queen returning at once to the nest. The queen with which I had been experimenting had obviously been stung, for she appeared to be half paralysed and could walk only with great difficulty. I placed her on the old Eynsford nest, towards which she now showed considerable affection or, to be more exact, as much interest as her condition would allow. In the morning she was dead.

It would certainly not be rash to say that in the case of *Vespa vulgaris* L. and *V. germanica* F., at least, every queen is a potential parasite on her own species. In a later note, I shall cite instances which provide further evidence for this statement.

Dept. of Entomology, Nat. His. Museum,
Cromwell Road, S.W.7.
November 16th, 1935.

Aphanogmus fasciipennis Thoms. (*Vol. LXXI, p.* 256, *supra*).—The specific name '*fuscipennis*' is so obviously impossible that I wonder at the Editors passing it. *A. fasciipennis* was originally described in Öfv. xv, 1857, p. 805, by Thomson from southern Sweden, so it is not surprising that it occurs in Britain! Both Kieffer (André, Spp. Hym. Europ. x, 1907) and Mr. Nixon seem to have overlooked the Rev. T. A. Marshall's record of this species (Cat. Brit. Hym. Oxyura, 1873, p. 3; Trans. Suffk Nat. Soc. i, 1929, p. 57) in Britain, where is it by no means rare in both sexes from mid-July to mid-September: I have often captured it running over the windows of this house. It is most probably among those unnamed species of its group that are referred to by Marshall as long ago as 1868.—CLAUDE MORLEY, Monks Soham House, Suffolk: *December 15th*, 1935.

MISCELLANEOUS RECORDS OF PARASITISM. I.

BY GEORGE SALT, PH.D., D.SC., F.R.E.S.

The following records of parasitism are by-products of work done some years ago at the Farnham House Laboratory. The parasites mentioned were in every case determined by Dr. C. Ferrière of the Imperial Institute of Entomology.

1. Syrphid Parasites.

Between November 18th and 28th, 1930, Mr. P. B. de Rippas collected a number of aphidophagous Syrphid larvae from cabbages and French artichokes (*Cynara Scolymus*) in the neighbourhood of St. Laurent de Var, Alpes-Maritimes, France. Unfortunately, the larvae from the two plants were not separated and no information is available about the aphids on which the several species of Syrphid larvae were feeding. On their arrival at the laboratory the larvae were already pupating rapidly and within a week most of them had either pupated or died from want of food, since it was impossible to obtain aphids for them in England at that date. 392 puparia of one species and 31 of another were selected and the remainder of the material was discarded.

Syrphus balteatus Degeer.

This species was very greatly in the majority and was presumably, though not certainly, collected from French artichokes (*Cynara Scolymus*). 392 puparia of this species were isolated in small vials, and the emergents recorded. A few puparia were opened so that parasite larvae might be obtained for study, and all puparia that failed to yield emergents were finally dissected. The results follow :—

Emerged :				
Syrphus balteatus ...	127 ♂,	98 ♀	from	225 puparia
Bassus laetatorius ...	0 ♂	29 ♀	,,	29 ,,
Pachyneuron formosum ...	81 ♂	156 ♀	,,	29 ,,
Homocidus tarsatorius ...	1 ♂		,,	1 ,,
Dissected :				
Contained living larvae of *Bassus laetatorius*				3 ,,
Contained dead remains of *Bassus laetatorius*				2 ,,
Contained dead fly remains				54 ,,
Total puparia of known contents				343 ,,
Contained indistinguishable remains ...				49 ,,
				392 ,,

Of the 343 puparia whose contents are known, 34 or 9.9 per cent., were parasitised by *Bassus laetatorius;* 29 or 8.5 per cent., by *Pachyneuron formosum;* and only 1 or 0.3 per cent., by *Homocidus tarsatorius.*

The Tryphonine, *Bassus laetatorius* Fabr., is undoubtedly a primary parasite of *Syrphus balteatus.* Its larva was not studied in detail but it may be mentioned that its tracheal system has the accessary lateral commissures usual in Ichneumonid larvae and its labial ring is produced apically to a single long, rather slender, point. This parasite was also reared from puparia of three other unidentified species of Syrphidae from the same source. On a rapid survey of the literature I find it recorded as a primary parasite from twenty-eight species of Syrphidae and as a hyperparasite from one Lepidopteron, *Cydia pomonella* Linn. (Bragina, 1926).

The Pteromaline, *Pachyneuron formosum* Walker, was usually a primary parasite of *Syrphus balteatus* puparia, but in one case it was definitely ascertained that it had acted as a hyperparasite on *Bassus laetatorius.* In this case the Tryphonine had pupated before its development was stopped by the Pteromaline, and four females of the latter emerged instead of the single Bassus. The number of *P. formosum* emerging from a single puparium varied from 1 to 22; the groups coming from each of the 29 infested puparia were :—

♂	♀	*Total.*	♂	♀	*Total.*	♂	♀	*Total.*
1	--	1	2	4	6	—	10	10
—	3	3	3	3	6	3	7	10
1	2	3	4	2	6	6	5	11
—	4	4	1	7	8	6	6	12
—	4	4	2	6	8	—	13	13
—	4	4	3	5	8	4	9	13
2	2	4	2	7	9	6	8	14
—	5	5	3	6	9	10	5	15
—	5	5	7	2	9	4	1	22
2	4	6	9	0	9			
						81	156	237

The Tryphonine, *Homocidus tarsatorius* Panzer emerged in one case. I can only record, therefore, that the parasite emerged from a puparium of *Syrphus balteatus* without statement of its status as a primary or secondary parasite. No larval skin of *Bassus laetatorius* was found in the puparium from which this parasite emerged, but it might have been overlooked.

Syrphus auricollis Meigen.

The puparia of this are similar to those of the former species and were at first confused with them. The two kinds may be distinguished, however, by the dark markings on the dorsum and by the colour and shape of the posterior spiracles. Of 31 puparia of *S. auricollis* isolated in vials, 6 failed to emerge and on dissection were found to contain unrecognizable remains. Of the 25 puparia whose contents are known, 18 yielded adult flies (6 ♂, 12 ♀); 3 contained fly remains; 2 were parasitised by *Callaspidia dufouri* Giraud; and two by *Microterys aeruginosus* Dalm.

The Cynipid parasite, *Callaspidia dufouri* Giraud, actually emerged in only one case. A full-grown larva, found in another puparium, pupated but failed to complete its development. By its structure, however, the pupa could be identified with the adult that had emerged previously. The head of this larva was subtriangular, bilobed dorsally, without darkened tentorial structures but with two circular swellings on the dorsal part of the face and with prominently swollen maxillary and labial areas. The mandibles were long and narrowly triangular with a large sub-apical tooth. I have no reason to doubt that this species is a primary parasite on *Syrphus auricollis*.

The Encyrtine parasite, *Microterys aeruginosus* Dalman, emerged from two puparia of *Syrphus auricollis*; 21 ♂ from one puparium 10 ♂, 10 ♀ from the other. It is probably a primary parasite.

It is interesting to observe that the species of parasites reared from these two closely related species of aphidophagous Syrphidae were confined to one species or the other. These notes should be compared with those of Voukassovitch (1925). For the determination of both species of *Syrphus* I am indebted to Dr. O. W. Richards.

2. Parasites of *Cephus pygmaeus* Linnaeus.

English parasites of this species have been recorded elsewhere (Salt, 1931) but two records from France were not included.

Hemiteles hemipterus Fabr. (Cryptinae), a primary parasite on *Cephus pygmaeus* at Gonesse, Seine-et-Oise, France. Collected October 7th, 1930, as a first-stage larva. An adult brachypterous female emerged in the laboratory November 7th, 1930.

Gambrus tricolor Gravenhorst (Cryptinae). A full-grown larva and three cast skins of its earlier stages found together with the remains of *Cephus pygmaeus* within the cocoon of the latter at

Grignon, Seine-et-Oise, France; October 6th, 1930. The larva had spun its cocoon in the laboratory on October 16th and an adult female emerged October 22nd, 1930. It is interesting to observe that while only one individual of *Gambrus tricolor* was reared from over 110,000 stalks infested by *Cephus* at Harpenden, one was found in only 9 infested stalks obtained at Grignon. It may be that this species is a much more important parasite of *Cephus* in France than it is in England.

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King's College, Cambridge.
December, 1935.

A LABORATORY METHOD FOR REARING *SCIARA* AND PHORID FLIES.

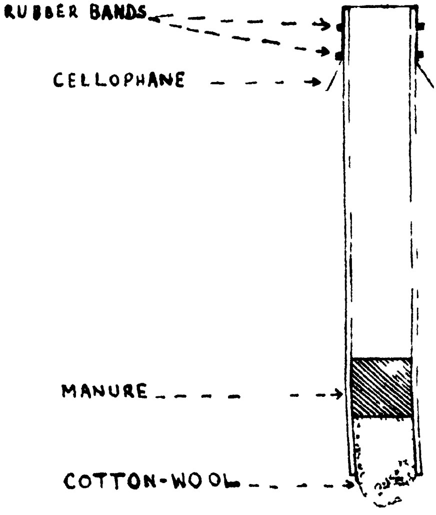
BY M. D. AUSTIN, F.R.E.S., AND R. S. PITCHER, B.SC.

During the course of an investigation carried out at Wye, upon certain Dipterous pests of cultivated mushrooms, several methods of rearing—two of which are mentioned by one of the present writers in Ann. App. Biol. XXI, No. 1, pp. 167-168—were tried out. Various modifications have been tried, until the method described below was elaborated and this has proved very successful for our purpose.

It was necessary on the one hand that our biologic material should be kept in suitable conditions and on the other hand the method employed should enable critical observations to be made at frequent intervals. The flies concerned were mainly *Sciara* spp. (Family Mycetophilidae) and some work was also done with Phorids (Family Phoridae).

The method described below has been used successfully over a long period with *Sciara* spp. notably *S. fenestralis* Zett. These comparatively small flies were obtained when required as pairs *in cop.*, from an infested mushroom house. In practice these pairs are not difficult to capture *in cop.* on the inside walls of the mushroom houses and are best taken in small tubes (7 mm. diameter) for the ultimate purpose of easy transference to the rearing tubes.

The rearing tubes consist of convenient lengths—in this case about 8 cm.—of glass tubing with a diameter of 10 mm., open at both ends. At one end sterilised stable manure is introduced and packed from the other end by means of a glass rod, care being taken to avoid soiling the inner surface of the tube. It is important to obtain a level surface on the manure, in order to ensure that the female, when ovipositing, will lay her eggs on the surface of the manure and not deeply within it. The manure is packed to a depth of about 1 cm. and, from below, a plug of cotton-wool is inserted and the manure plug is then pushed up so that its surface is now at a distance of 2 cm. from the base of the tube. (See Fig. 1.)



The tube is then ready for the introduction of the pair of flies from the tube in which it was captured. Whatever the inner diameter of the rearing tube the outer diameter of the tube containing the captured pair should be preferably a little smaller. The cork of the tube is quickly removed from the latter, the open end placed within the free end of the rearing tube and the pair readily transferred. The empty tube is then removed and the rearing tube closed at its open end with a cellophane covering, which is held in place by one or two rubber bands.

A pair of flies thus transferred can then be treated as desired. In the case of mushroom-attacking species the tube, manure plug downwards, is placed in a convenient receptacle in a darkened situation. With *Sciara* spp. oviposition usually takes place on the manure. About a week elapses between copulation and the death of the female following oviposition. During this period it is sometimes necessary to add moisture, and this is easily done by damping the manure from below after removing the cotton-wool plug, or by wetting this plug itself. If the tube is placed with the plug end in a shallow film of water, the manure may take up an excess of moisture. If this happens, a vigorous growth of moulds may appear and this inhibits development of the *ova*. When oviposition is complete and the flies are dead, the male and female may be removed for the purpose of establishing their identity with certainty. If the progeny of the original pairs are carried through to adult flies again, they are used as a pure stock from which to obtain further pairs.

If necessary, eggs can be left where laid and hatching observed through the tube wall. In a similar manner the larval life can be studied, and if the manure is suitable as food, the whole life-cycle can be followed through in the tube. However, it is frequently more convenient to transfer individual *ova* to more suitable containers, so that subsequent development can be observed with greater precision. In this case the manure plug is carefully removed from below, or by pushing it right through to the upper end, and the eggs are then transferred. For this purpose solid watch-glasses fitted with a flat glass cover were found to be suitable. In these, finely powdered sterilised manure is placed, because not only is it found that the *Sciara* larvae feed and mature in this medium, but the development of the egg is more readily observed with the aid of a binocular microscope. Moreover, temperature and humidity conditions can be controlled within certain limits by transferring the solid watch-glass to an incubator and by adding moisture.

Larvae have been successfully reared to maturity in these conditions, pupation has followed, eventually adults being produced.

In order to facilitate the study of ecdysis, individual larvae are isolated in circular glass cells of approximately 11 mm. internal diameter and 3 mm. height. These are cemented to 3 in. x 1 in. micro. slides with Canada balsam. They are covered at the top with a circular cover glass which is secured in place with vaseline. To maintain humidity within, a circle of filter-paper is cut to fit the cell, and on this a minute pellet of the moistened powdered sterilised manure is placed. It has been found that unless additional precautions are taken, excessive drying out may result when the slides are kept in an incubator. To overcome this, numbers of the slides are placed in a flat tin (tobacco tins are commonly used) in which is placed a layer of damp sand, covered with blotting paper. Both this and the filter-paper in the cells require periodical, if not daily moistening to maintain suitable conditions for larval development. Providing that the food is renewed as required, larvae of *S. fenestralis* pass through readily to adults in these cells.

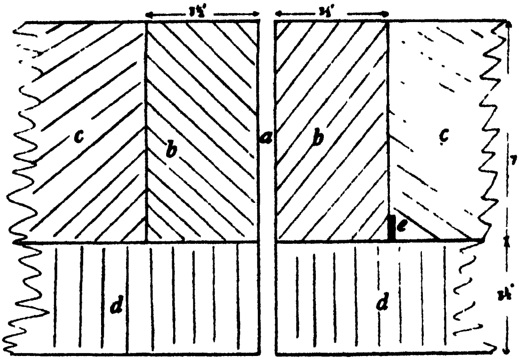
It is not suggested that the method described above is entirely original, the account being given in the hope that it may prove of some interest to other workers.

The writers are indebted to Mr. J. H. Stapley, B.Sc., A.R.C.S., for his help and suggestions in the elaboration of certain details of the technique so described.

South-Eastern Agricultural College,
Wye, Ashford, Kent.
December 6th, 1935.

Anoncodes melanura L. as a destructive insect.—The notes on the occurrence of *Anoncodes melanura* L. by Mr. Langford Lewis (E.M.M., Vol. LXXI, p. 185), Mr. Haines (*l.c.*, p. 211) and Mr. McKechnie-Jarvis (*l.c.*, p. 259) are of sufficient interest to draw fresh attention to the subject. In the standard works this beetle is stated to be found on the seashore and along estuaries. Theobald (Journ. S.E. Agric. Coll. Wye, No. 17, 1908, pp. 180—181) gives an instance of the presence of larvae in the woodwork of a greenhouse at Wisbech in March; over 100 larvae were found in a piece of wood six inches square and the benches were falling to pieces. Preserved larvae from this source are still in the British Museum. He says that the beetles were hatching out in hundreds, this presumably in March, and suggests that the life-cycle is as short as two months. This statement would seem to be open to doubt, for my Coleopterist colleagues would agree with me in saying that specimens of the beetles arrive at the Museum during June and July. The earliest date in my records is May 31st. The suggestion is made that in the Wisbech timber larvae of different ages were present and the emergence of the adults was spread over a period of several months. In February, 1908, larvae were received with the statement that they were burrowing in the woodwork of a wharf at Rainham, Essex, and 'doing really serious damage.' In June, 1914, a Regent Street firm reported that the beetles were emerging from walnut panelling in their store, but enquiries failed to show that any decayed wood was present. In 1918 the insect could be found in numbers along the canal banks in the Birmingham area and also on the river banks at Stratford-on-Avon; on more than one occasion since then it has been found burrowing in the sleepers of a private railway siding in the former district. Other localities where the writer has noted the occurrence of *Anoncodes* are the banks of the Weybridge Navigation Canal, around Dorking, Pulborough, Chichester, Totton near Southampton, Cambridge and during last summer along the Severn estuary from Cleeve Abbey to Ilfracombe; at the former place it was plentiful towards the end of July

The main purpose, however, of this note is to comment on the presence of the beetle in the London area. Our records show that in recent years it has certainly not been rare. At one time adults were more common than they are now around the railway bridge at Putney, and Mr. H. W. Parker once found it in 'considerable numbers' in a small yacht lying at anchor there; the beetles appeared to come from between the floorboards of the cabin. The slipway close to the bridge may have been, and may still be, the breeding place. For several years in succession *Anoncodes* appeared in numbers sufficient to cause alarm in Hammersmith, but some distance from the river; they always congregated in a gatehouse. Though a detailed inspection failed to establish with certainty their breeding place, suspicions pointed to a disused wooden conduit which ran just outside the window, below which was a manhole. For at least the last seven years a walk along the Strand, Fleet Street, through the City streets (Threadneedle and Lombard Streets in particular), the Victoria Embankment, Farringdon Road, High Holborn, Euston Road and the Outer Circle of Regent's Park by the Zoo, on a Saturday afternoon would usually reveal one or more specimens crawling on the pavement. This summer (1935) serious invasions occurred in a City shop, in a basement of a comparatively new building near Waterloo. Bridge, and in a warehouse in High Holborn; in the latter two instances insect-exterminating firms had to be called in. In one instance the source of the trouble was undoubtedly timber which had been used to form an archway and subsequently bricked over, for the beetles could be seen emerging from the wood through the disintegrated pointing of the brickwork. In another instance a basement kitchen overlooking an Underground Railway aerating shaft was invaded by the beetle. Last year the beetle was sufficiently numerous in Barking to attract the attention of the health authorities. To cut the instances short, the writer has noted the insect at various points along the Thames as far as Maidenhead.



(*a*) Pipe to sump; (*b*) initial mass of concrete forming the well-head; (*c*) concrete mass added later; (*d*) concrete base of well-head; (*e*) position of infected piece of shuttering.

There must be some reason for the increase of this insect within the London area, and it seems to the writer that the recent extensive rebuilding may account for it. There must be vast quantities of timber buried beneath London that the insect must find highly congenial for breeding in, and from which it gains emergence to the street level by cracks and crevices not normally observed. Commander Walker's suggestion (*l.c.*, p. 185) that *Anoncodes* is a strong flier is true, but will not explain its presence in such numbers over so wide an area. Why it should appear, for instance, in a chemist's shop in a City street, or in a basement where paper documents only are stored, and not affect any of the surrounding property can most easily be explained by the fact that these positions are close to the point of emergence.

One curious case has arisen since these scattered notes were first put together; I am indebted to my friend Mr. Claude Sisley for the particulars. An artesian well near the Guildhall was being repaired at the end of November. The accompanying diagram will illustrate the position of the piece of wood which was found to be riddled by the larvae. The well-head was constructed with a base of concrete three and a half feet thick, upon which was raised a square mass of concrete seven feet high and seven feet square with the pipe to the sump in the middle. Shuttering enclosed this top part until the concrete had set, when it was removed, with the exception of one piece at the bottom; an additional mass of concrete was then added to the well-head to give extra support, completely enclosing the board. This was seven years ago. A short time ago alterations to the well were necessary and the outer concrete mass was removed, revealing the piece of timber inadvertently left in. On examination, this board was found to be riddled with the borings, and several living larvae, some quite small, others almost full-grown, were discovered. There was no means of egress to the surface. In spite of having been buried for seven years, the insect had continued to breed within the concrete. The remains of dead adults may have been present, though not noted by the workmen. No doubt coition could have taken place in the burrows and in the cavity left by the crumbling timber, which was in a surprisingly dry condition. This instance might be correlated with that put on record by Dr. Blair (Proc. Roy. Ent. Soc. London, Vol. X, Pt. 1, p. 19). The piece of wood is coniferous, but on the Continent oak also has been recorded as being subject to attack (Escherich, Forstinsekt. Mitteleurop., Vol. 2, p. 202, 1923). In a recent paper by Schedl (Zeit. angew. Ent., Vol. 20, p. 639, 1934), who gives a photograph of the damaged timber, an attack on the floor-beams of a lighter standing quite clear of the water covering the bottom is noted, and this case may provide a partial explanation of the presence of *Anoncodes* in areas adjoining our canals; it is possible that barges may have contributed to the distribution of the insect.—F. Laing, British Museum (Nat. Hist.): *December 9th*, 1935.

A further note on Anoncodes melanura L.—Some years ago, between 1900 and 1905, I used frequently to find this beetle on the footways and window-sills in Pancras Road, King's Cross, and have assumed that it bred in the wooden partitions, or in loose pieces of wood lying partly buried, in the coal wharves on the opposite side of the road. I have also found it crawling on the footways in Highgate Road, N., and in the Strand.

A peculiar feature in respect to the habits of the larvae is the size of the cavities in which they live. This is to be seen in Schedl's figure and is even more striking in the piece of wood from the well-head referred to by Mr. Laing, and would afford ample room for the beetles to live in if unable to effect their escape. These cavities cannot be due entirely to the feeding of the larvae, or the space would be nearly filled with frass, as in the burrows of Longicorn larvae, but they are probably due in large measure to the decay of the wood. In this connection an earlier note of mine may be recalled.* An Oedemerid larva, presumed to be that of *Oedemera nobilis*, though I was unable to rear the larva to confirm this, was found in large hollow spaces near the base of old stems of Hemp Agrimony, *Eupatorium cannabinum*, a space some ten inches in length being cut off in the hollow stem by plugs of fibre, apparently to keep out woodlice, spiders, etc.—K. G. Blair, British Museum (Natural History): *December 12th*, 1935

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* Proc. S. Lond. Ent Nat. Hist. Soc., 1932-33, p 104.

Coleoptera in Dumfriesshire.—The earlier part of this year (1935) in this district was very dry, so that although the weather was favourable for outdoor work the results were comparatively poor. Still, it would be a bad season indeed which did not yield something of interest, and I wish to add the following to my previous records. *Leistus fulvibarbis* Dej., odd specimens under stones. *Loricera pilicornis* Fab., running on roads, common. *Bembidion lampros* Hbst., common. *Bradycellus collaris* Payk., under stones lying in hollows on White Hill, near Langholm, in June. I have taken odd specimens of three species of *Haliplus* here. *H. lineatocollis* Mshm. and *H. ruficollis* Deg. in peat holes on the moors, and *H. wehnckei* Gerh. in flood refuse from the R. Kirtle. *Cercyon depressus* Steph., under rejectamenta on the shore at Eastriggs and Browhouses. *Acrotona laticollis* Steph. in decaying vegetable matter. *Microdota mortuorum* Th., in moss, several from various localities. *Mycetoporus clavicornis* Steph., rare, a pair swept on Newton Moss in June. *Tachyporus obtusus* Lin. is very common and on several occasions I have swept *T. nitidicollis* Steph. in its company. *Tachinus humeralis* Grav. is not uncommon in decaying fungi in autumn and, also in fungi, odd specimens of *T. pallipes* Grav. *Philonthus nigrita* Grav., fairly frequent in moss in spring. *Staphylinus brunnipes* Fab., one in moss at Nutberry in May. I have not met with any species of this genus at all plentifully in this district. *Othius punctulatus* Goeze is common in river refuse. *O. laeviusculus* Steph., odd specimens at Nutberry and Newton Moss. *O. melanocephalus* Grav. is not rare in wet moss, while *O. myrmecophilus* Kies. is much less frequent. *Lathrobium ripicola* Czwl. swept in summer and in grass tufts in winter. *Oxytelus complanatus* Er., at Nutberry by evening sweeping, by no means common here. *O. nitidulus* Grav. is also only occasionally met with. *O. rugosus* Fab. is common everywhere. A form with red elytra but dark antennae occurs occasionally. *Stenus rogeri* Kr. is rare, but *S. clavicornis* Scop. is very common in moss, etc. *Heterocerus sericans* Kies., one under a stone on the marsh at Gretna, 30.v. It is not easy to see, as its colour harmonises well with the sand. *H. marginatus* Fab., a few flying on the marsh here on May 3rd. Three species of *Colon* were met with this year. *C. brunneum* Latr., one beaten from a roadside hedge, but I had met with it previously in 1921. In June I swept one *C. fusculum* Er. (*serripes* Sahl.) on the road to Corriés Mill, and one *C. calcaratum* Er. in a rough lane near Springfield. *Catops chrysomelinus* Panz. and *C. nigrita* Er., by sweeping. Neither can be called common. *Cryptophagus dentatus* Hbst. and *C. setulosus* Stm., generally distributed and hardly rare. *Lathridius nodifer* Westw., common. *Enicmus histrio* Joy, Mr. J. Collins pointed out to me that some of my *E. transversus* Ol. were this species. It is not uncommon. *Corticaria pubescens* Gyll., odd specimens beaten from rough herbage in June. *C. elongata* Gyll., occasional in the sweep-net. *Coccinella 7-punctata* Linn., during the past ten years I have handled thousands of living ladybirds, but never met with this species until 13.ix this year, when I found a single specimen in a road in this village. *Coccidula rufa* Hbst., in flood refuse, etc., locally common.

Octotemnus glabriculus Gyll., common in a *Boletus* on beech stumps, frequently in company with *Cis boleti* Scop. *Omosiphora limbata* Ol., one swept in a lane near Springfield. *Malthinus frontalis* Marsh., Nutberry, sweeping under fir trees. *Malthodes fuscus* Walt., locally common. *Luperus longicornis* Fab., locally abundant on birch. *L. flavipes* Lin., one from hawthorn in May. *Lochmaea crataegi* Forst., a few from hawthorn near the mouth of the R. Kirtle. *L. suturalis* Th. abundant on and under heather. *Apion cruentatum* Walt., rare. *Polydrusus cervinus* Lin., a specimen from flood-refuse along the Solway estuary. It also occurs occasionally on birch, but may be passed over among the crowds of *Phyllobius pyri* Linn. which occur with it. *Tropiphorus tomentosus* Marsh., occurs here and there not uncommonly. By evening sweeping in June I obtained a single *T. obtusus* Bonsd. On June 28th by the same method I captured *Barynotus moerens* Fab. *Rhinoncus perpendicularis* Reich. occurs in small numbers in the Gretna district. Apparently rare in Scotland. *Ceuthorrhynchidius troglodytes* Fab., common where plantains grow. *Ceuthorrhynchus triangulum* Boh., for the third year in succession I have met with this species on yarrow (*Achillea Millefolium*) near Springfield. Several hours' work produced six specimens. It is extremely local, and only seems to occur during the second half of May. *Dorytomus rufulus* Bell, locally common on sallows in June and July. *Phloeophthorus rhododactylus* Marsh., a few beaten from broom near Springfield in April. *Anaspis frontalis* Lin., less common here than some of its genus.—JAS. MURRAY, 6 Burnside Road, Gretna, Dumfriesshire: *December 9th*, 1935.

Aquatic Hemiptera in Somerset.—There are probably few counties in the British Isles that present such a wide variation of habitats as Somerset, ranging from the brackish ditches along the coast to the drains, pools, and canal-like rivers, the peat-bogs of Sedgemoor and the more rapid limestone streams which have their origin in the pools and lakes among the limestone hills.

The various waters of the levels around Weston-super-Mare have proved the most productive, both in the number and variety of species, closely followed by the old lead-mine pools of the Mendips.

As far as can be ascertained, about thirty-five species have previously been recorded from the county, while the following species mentioned by the writer appear to be new records; obviously the list is yet incomplete, since there are several species which should undoubtedly occur, but which have not yet been taken.

One of the most noteworthy captures was that of *Mesovelia furcata* Muls. and Rey. One apterous female and four apterous males were found in a pool near Weston-super-Mare in September, 1935, and in the same pool occurred *Gerris argentata* Schum. and *G. odontogaster* Zett. with *Hydrometra stagnorum* L., *Salda cincta* H. Schff., *Naucoris cimicoides* L., *Notonecta viridis viridis* Delcourt, *Ranatra linearis* L., *Corixa panzeri* Fieb., *Cymatia coleoptrata* F. and *Microvelia reticulata* Burm.; the latter species has been taken near Clevedon, Kingston Seymour, several localities near Weston, at Cannington, East Harptree, Shapwick and on the river Axe near Crook's Peak, where the less common winged form occurred in some numbers. *Velia currens* F. is everywhere common on nearly all running water, but the writer has taken only one macropterous specimen: this was a female picked out of thousands of the apterous forms which were captured on a stream at Flax Bourton. *Gerris odontogaster* Zett. occurs at Priddy, the brachypterous and macropterous forms being taken together. A single macropterous specimen of *Hydrometra stagnorum* L. was taken on a ditch near Kingston Seymour; the usual brachypterous condition is not so common as might be expected, so far having been captured only in a pond at Wraxall, Emborough Lake in the Mendips, Kingston Seymour, Cannington, Barrow Gurney, on the river Yeo near Crook's Peak and near Weston. This species is readily overlooked, as it is apt to hide among the vegetation near the bank, or to cling to the bank where it overhangs. *Notonecta obliqua obliqua* Gallén, though very widely distributed, is nowhere common. In Somerset it has occurred in a pond near Crook's Peak, Fast Harptree and Priddy. *Notonecta viridis viridis* Delcourt has recently been quite numerous, appearing in small numbers in several localities, most commonly along the coast. *Corixa panzeri* Fieb., like *N. obliqua*, is widely distributed but rarely occurs in large numbers. It was captured in the following localities: Wraxall, Priddy (commonly), Banwell, Kingston Seymour, Weston, Brean Down and at Redhill, whilst a dark form was noted in the river Axe near Crook's Peak. *Corixa affinis* Leach is quite common in certain ditches, and a few ponds close to the sea, all along the coast where the environment is suitable. *Arctocorixa scotti* Fieb. and *A. castaneia* Th. occur together in two peaty sphagnum pools in the Mendip Hills. *A. venusta* D. and S. is not common, though it has occurred in small numbers in a stream near Long Ashton, in the river Yeo at Crook's Peak and in a stream at Spaxton. *A. limitata* Fieb. is even more scarce, a single male having been taken at Priddy. *A. selecta* Fieb. has been taken at Kingston Seymour with *A. lugubris* Fieb. *Callicorixa* is poorly represented; *C. praeusta* Fieb. occurs sparingly; *C. concinna* D. and S. is definitely scarce, odd specimens being taken at Flax Bourton, Wraxall, Priddy and Banwell, in each case in ponds.

Frequent mention has been made of Priddy, for it is here that the most productive Corixa hunting has been done. In one of the pools sixteen species occur, and apart from those already mentioned, four interesting and unusual insects have been taken, though quite sparingly, namely *Arctocorixa carinata* Sahlb., *Cymatia bonsdorffii* Sahlb., a single specimen of the rare macropterous form of *Cymatia coleoptrata* F. and *Glaenocorixa cavifrons propinqua* Fieb. The former and the latter were still in the larval stage on October 13th. The specimens of *Glaenocorixa propinqua* Fieb. are as large as *G. cavifrons* Th., but they differ in that they have dark brown mottlings and lines upon a golden background; the eyes are not quite so prominent, and the facial impression is slightly deeper and higher between the eyes. *Micronecta minutissima* L. has also been captured and occurs in the river Yeo at Congresbury.—G. A. WALTON, 34 Northumberland Road, Redland, Bristol 6: *October 29th*, 1935.

On a sudden outbreak of Dalia (Hylemyia) brunnescens Zett. on Sweet Williams (Dianthus barbatus) in Leicestershire.—On December 15th, 1934, Sweet William plants were received from a garden near Leicester. The plants were well grown with leaves three to four inches long and one to one and a half inches wide. The leaves were extensively mined by larvae of *Dalia brunnescens* Zett. and the larvae were still feeding. The mines were sometimes elongated and straight, in others sinuous and in many cases large irregular blotches. The leaves were streaked and blotched crimson and yellow. Early in March, 1935, the larvae left the plants and pupated in the soil, the last puparium forming on March 19th. On March 13th the garden was visited and over 100 puparia were collected. They were immediately under the plants and about a quarter-inch below the soil. There were twenty twenty to thirty under each of about 100 plants. The outbreak was confined to this garden and was a late attack. A large batch of plants from this stock was taken earlier in the season to a garden about half a mile away. These were not attacked. From all the puparia reared and collected flies emerged on May 3rd and 4th. They were supplied with Sweet William plants and sugar and water for nourishment. Males and females appeared to be in about equal proportions. Pairing was never observed and no eggs were laid. The last flies died in the middle of June. No trace of them has been seen since in the garden, although there is food in abundance. The outbreak would seem to have disappeared in the one generation.—A. ROEBUCK, Midland Agricultural College, Sutton Bonington, Loughborough: *November 23rd,* 1935.

Corixa dentipes Thoms. in Nottinghamshire.—On September 14th last, while collecting aquatic Coleoptera from the warping drains in the parish of Misson, in the extreme north of Nottinghamshire, I bottled a number of water-bugs for the local collection in the Nottingham Natural History Museum. Among these were four specimens of what I supposed to be *Corixa geoffroyi,* but on mounting them next morning I found that one of the specimens was a typical ♂ of *C. dentipes.* If the species occur in anything like this numerical ratio, *C. dentipes* must be common here, as *C. geoffroyi* was very abundant. Unfortunately I was unable to pay a second visit to the district, but hope to do so next spring. The land is low-lying, only a few feet above sea-level, and the soil is peaty. The drains support an abundant aquatic flora, chiefly *Potamogeton* spp., *Ceratophyllum, Myriophyllum, Callitriche,* etc. Aquatic beetles were scarce and all of common species, *Haliplus wehnckei* being the most notable capture. This was determined for me by Professor Balfour-Browne.—J. W. CARR, Nottingham: *December 10th,* 1935.

Society.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON: *Wednesday, 2nd October,* 1935.—DR. S. A. NEAVE, O.B.E., President, in the Chair.

The following were elected Fellows of the Society: C. J. Golledge, 8 Dryden Mansions, Queen's Club Gardens, W.14; M. S. Mani, Entomological Section, Zoological Survey of India, Indian Museum, Calcutta, India; Geoffrey R. Walker, M.B., Ch.B., D.T.M., The Sir Alfred Jones Research Laboratory, Freetown, Sierra Leone, West Africa.

The deaths of Dr. Paul Martin, elected in 1935, W. Ormiston, elected in 1913, and of A. H. Swinton, elected in 1876, who at the time of his death was the senior Fellow of the Society, were announced.

Dr. O. W. Richards discussed Island Races of British Humble-bees. Dr. L. G. Higgins exhibited the Melitaeine butterflies, ***Euphydryas wolfensbergeri*** Frey and ***E. desfontainii*** Godt., and made remarks on their geographical distribution. Professor G. D. Hale Carpenter (on behalf of Lieut.-Colonel H. F. Stoneham) gave an account of the copulation of ***Catopsilia*** in the air, and discussed the attraction of ***Precis*** to ***Danaus chrysippus*** with its scent brushes extended. Mr. D. S. Wilkinson exhibited *Euphydryas aurinia* (Rott.) from Ireland parasitised by *Apanteles bignellii* Marshall. The President exhibited a photograph of the only portrait of Jacob Hübner known to exist.

The following papers were read: 'The Rhopalocera of Abyssinia,' by Professor G. D. Hale Carpenter, M.B.E.; 'The Mutillid Wasps of the islands of the Pacific Ocean,' by Professor C. E. Mickel, Ph.D.

Wednesday, 16th October, 1935.—Dr. S. A. Neave, O.B.E., President, in the Chair.

The following were elected Fellows of the Society: Valentine Hugh Wilfred Dowson, Kut As-Sayyid Estate, Basrah, Iraq; Alterbury Coulston Evans, Rothamsted Experimental Station, Harpenden, Herts.

The deaths of G. B. de B. Kershaw, elected in 1904, and the Rev. Prebendary A. P. Wickham, elected in 1917, were announced.

Dr. F. W. Edwards gave a lecture on the British Museum Expedition to Eastern Ruwenzori, 1934-35, illustrated by lantern slides. Dr. W. H. Thorpe discussed the biology of *Encyrtus* (*Comys*) *infelix*, a remarkable Chalcid parasite of *Lecanium hemisphaericum*.

Wednesday, 6th November, 1935.—Dr. S. A. Neave, O.B.E., President, in the Chair.

The following were elected Fellows of the Society: George Frederic Bartholomeuz, L.M. & S. (Ceylon), D.T.M. & H. (England), The Medical and Sanitary Services, Colombo, Ceylon; Major J. E. Drysdale, Shordale, P.O. Umtali, Southern Rhodesia; G. M. Henry, The Colombo Museum, Colombo, Ceylon; Sheikh Abdur Rashid, 78A Model Town, Lahore, India; Charles Roberts, F.R.H.S., Llysmair, Ruthin, Denbighshire; Frank Henry Taylor, The School of Public Health and Tropical Medicine, University of Sydney, N.S.W., Australia; Dr. E. M. Walker, Department of Invertebrate Zoology, University of Toronto, Toronto 5, Canada.

The death of A. L. Rayward, elected a Fellow of the Society in 1907, was announced.

Sir Edward Poulton, F.R.S., exhibited and discussed (1) a second record of *Callimorpha hera* taken in the Isle of Wight on 28th August, 1935: (2) an aquatic 'woolly bear' caterpillar taken at Pleasant Hope, near Paruka, Lower Essequibo river, British Guiana, on 15th May, 1935, by Dr. J. G. Myers; (3) a spider mimicking the ant *Cephalotes atratus,* taken on 24th May, 1935, at Kobarima, N.W. District, British Guiana, by Dr. J. G. Myers; (4) a drawing and description by Mr. F. W. Frohawk of the nest of the wood wasp, *Vespa sylvestris* L., built against a martin's nest, under the gable of the gardener's house at the Experimental Gardens, Wisley (observed on 9.viii.1891 and 29.viii.35); and (5) notes by Mrs. M. D. Brindley on pied wagtails feeding their young on dragonflies, July, 1935. Professor G. D. Hale Carpenter discussed (1) dragonflies as enemies of *Glossina;* (2) a Hesperiid emitting fluid from the anus to moisten dung for absorption, observed by Mr. T. H. E. Jackson; and (3) meadow pipits attacking the Magpie moth when unusually abundant in North Uist. Mr. L. Parmenter exhibited and discussed a record of the first male of *Triglyphus primus* Loew (Syrphidae) taken in Britain. Mr. O. H. Latter discussed the reason for the order in which a wasp constructs the cells of a comb, illustrating his remarks with lantern slides; and a method of computing the number of cells in a comb, and an instance of limitation of the instincts of wasps.

Wednesday, 20th November, 1935.—SIR EDWARD POULTON, F.R.S., Hon. Life President, in the Chair.

The following were elected Fellows of the Society:—George A. Bisset, Department of Entomology, British Museum (Natural History), Cromwell Road, S.W.7; E. B. Britton, 99 Cornwall Road, Westbourne Park, W.11; K. H. Chapman, The Knowle, Knowles Hill, Newton Abbot, S. Devon; Miss Theresa Clay, B.Sc., 18 Kensington Park Gardens, W.11; Ernest P. Hodgkin, Riverdene, Broxbourne, Herts, and The Institute for Medical Research, Kuala Lumpur, Federated Malay States.

The Secretary read the following list of Fellows nominated by the Council as Officers and Council for the ensuing year: For President, A. D. Imms, Sc.D., M.A., F.R.S.; for Treasurer, Francis Hemming, C.B.E.; for Secretary, A. W. McKenny-Hughes, D.I.C. For other members of Council: R. B. Benson, M.A.; Professor P. A. Buxton, M.A.; Professor G. D. Hale Carpenter, M.B.E., D.M.; C. L. Collenette; Brig.-Gen. B. H. Cooke, C.M.G., C.B.E., D.S.O.; H. Willoughby Ellis; H. Eltringham, M.A., D.Sc., F.R.S.; G. Fox-Wilson; L. G. Higgins, M.A., M.R.C.S.; S. A. Neave, O.B.E., M.A., D.Sc.; J. A. Simes, O.B.E.; W. H. T. Tams; W. H. Thorpe, M.A., Ph.D.; C. B. Williams, M.A., Sc.D.

Sir Edward Poulton, F.R.S., exhibited and discussed the offspring of a pair of *Hyloicus pinastri* L., taken near Wareham, Dorset, in 1934, by Mr. H. L. Andrewes. He also described (*a*) (on behalf of Dr. Botha de Meillon) a Fossorial Wasp's attempts to find its mud nest after a change in position or the removal of an adjacent conspicuous object: Tzaneen, N. Transvaal; and (*b*) (on behalf of Mr. R. Carrick) experiments to test the efficiency of protective adaptations in insects, illustrated by lantern slides. Mr. W. N. Scott (a visitor) discussed the diurnal rhythm of emergence from the pupa. Professor G. D. Hale Carpenter exhibited and discussed (1) a note by Major S. S. Flower on evidence of preferential feeding among birds, and (2) a large silk 'nest' from Brazil. Dr. F. W. Edwards exhibited and discussed (1) living specimens of *Chionea lutescens* Lunst. (a wingless Tipulid) sent by Mr. J. P. Kryger from Denmark, and (2) Blepharoceridae from the Pyrenees. Dr. K. G. Blair exhibited some elm leaves with symmetrical punctures on either side of the midrib.

The following papers were read: 'Feeding habits of adult Lepidoptera Heteroneura,' by M. J. Norris (Mrs. O. W. Richards); 'Uganda Simuliidae,' by E. G. Gibbins; 'Descriptions of three new species of *Drepanosticta* (Odon.) from Philippine Is.,' by J. Cowley; 'New Mealybugs from East Africa,' by H. C. James; 'A revision of the Triplectidinae (Leptoceridae, Trichoptera),' by M. E. Mosely; 'The relation of humidity and temperature to the development of three species of African locusts,' by A. G. Hamilton; 'Hymenoptera of the New Hebrides and Banks Islands,' by Miss L. E. Cheesman; 'The study and ecology of Tsetse flies in East Africa,' by C. F. M. Swynnerton; 'The contents of the Parts and date of publication of Seitz: *Grossschmetterlinge der Erde*,' by Francis J. Griffin.—A. W. McKENNY-HUGHES, *Hon. Sec.*

MISCELLANEOUS OBSERVATIONS ON THE BIOLOGY OF *APANTELES GLOMERATUS* L. (BRACONIDAE).

BY A. G. HAMILTON, B.SC.

(Concluded from Vol. LXXI, p. 270.)

The caudal vesicle, I think, should not be called a segment because it is completely withdrawn into the abdomen during the third instar. Also, as Gatenby (1918) and several other workers have shown, its cell structure is very different from that of the normal segment. Like some other observers, I am of the opinion that the principal function of the caudal vesicle is respiration. Judging from the large flat cells composing its walls and the way the heart projects into it this seems the most reasonable suggestion. I agree with Seurat (1899) that it also acts as a locomotor organ, although Gatenby (1918) thinks this is not so. My reasons for doing so are based on observations on larvae which had been removed from a caterpillar and kept alive in normal saline solution in a watch-glass. Under these conditions the larvae appeared to attach themselves to the glass by the caudal vesicle and wave the body round in all directions.

(*b*) SPIRACLES.

The third instar is the only stage with stigmata. These can be seen both in the parasitic and non-parasitic periods. There are eight pairs; the first pair on the anterior margin of the mesothorax and the other seven pairs on segments 1 to 7 of the abdomen. Proof of these being the segments with the stigmata is easily obtained by cutting open the larva along the dorsal surface and folding back the sides. This reveals the correct segments of the thorax as the imaginal buds of the legs are situated on them.

Gatenby (1918), who studied the larvae of *A. glomeratus* and *M. connexus,* is rather confusing. Under the title 'Personal Observations' he deals with the larvae of both species and states that there are only seven pairs of spiracles, the first on the metathorax and the other six on segments 1 to 6 of the abdomen. Also in his figures of *Apanteles* he represents the spiracles as being on these segments. This does not agree with what I found nor with the observations of other workers.

THE RELATION OF THE INSTARS OF THE PARASITE TO THOSE OF THE CATERPILLAR.

As stated above, 7,891 parasitic larvae were examined. These were from 64 *P. rapae* and 179 *P. brassicae* caterpillars. The relationship of the larval instars of *A. glomeratus* to those of their host can be seen clearly in the adjoining tables :—

P. rapae caterpillars.

Number of parasitised caterpillars examined.	Stage of caterpillar examined.	Instars of *A. glomeratus*.			Number of parasites.
		First.	Second.	Third.	
2	second	37	—	—	37
11	third	190	22	—	212
21	fourth	148	250	—	398
30	fifth	90	736	36	862
64					1509

Average number of parasites per caterpillar 23.4.

P. brassicae caterpillars.

Number of parasitised caterpillars examined.	Stage of caterpillar examined.	Instars of *A. glomeratus*.			Number of parasites.
		First.	Second.	Third.	
3	first	171	—	—	171
9	second	279	—	—	279
93	third	2743	443	—	3186
62	fourth	222	2014	—	2236
12	fifth	13	496	1	510
179					6382

Average number of parasites per caterpillar 35.6.

EFFECT OF PARASITISM UPON THE GROWTH OF THE CATERPILLAR.

During May, 1933, a record of the time required by parasitised and non-parasitised caterpillars to reach the different stages was kept. The caterpillars were all stung during the first instar, one to four days after hatching. There did not appear to be any marked difference in the time required to reach the second and third stage, but the average time required to reach the fourth and fifth instar was as follows :—

(*a*) *P. rapae* caterpillars :

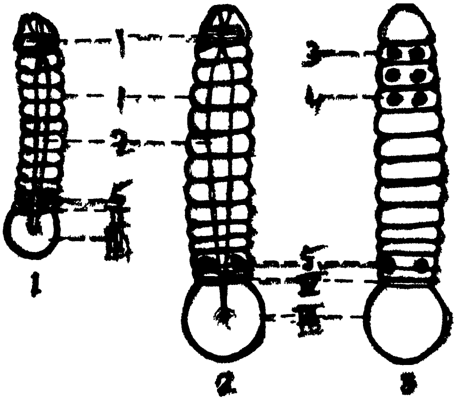
Non-parasitised, from egg to 4th instar 13·7 days.
Parasitised ,, ,, 4th ,, 17·0 ,,
Non-parasitised ,, ,, 5th ,, 17·3 ,,
Parasitised ,, ,, 5th ,, 20·0 ,,

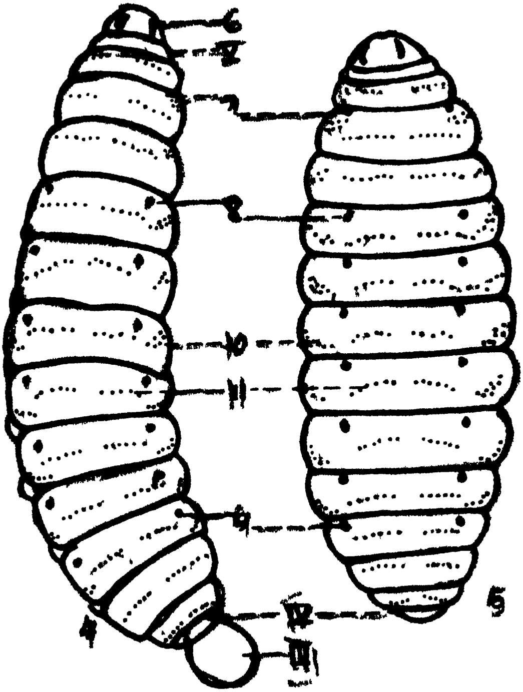
(*b*) *P. brassicae* caterpillars :

Non-parasitised, from egg to 4th instar 12·4 days.
Parasitised ,, ,, 4th ,, 14·2 ,,
Non-parasitised ,, ,, 5th ,, 16·2 ,,
Parasitised ,, ,, 5th ,, 19·3 ,,

ACKNOWLEDGMENT.

I am deeply grateful to Professor Munro, Professor of Entomology in the Royal College of Science, London, for his encouragement and criticism. I would also like to acknowledge my gratitude





to Mr. O. W. Richards, M.A., Lecturer in Entomology in the Royal College of Science, London, for the use of some of the material and data which he had collected, also for his valuable advice. Finally, I would like to thank Mr. A. M. Gwynn, late of Farnham House Laboratory, for some *Apanteles* cocoons.

DESCRIPTION OF THE FIGURES.

The drawings of the larvae of *A. glomeratus* are all made to the same scale (multiplied by 18 approx.). This was obtained by projecting a shadow of the specimens on to square paper. The detail was filled in by the use of the micrometer eye-piece. Figures 1 to 4 were obtained from specimens stained in Carbol Fuchsin, cleared and mounted, while figure 5 was obtained from a specimen which had been boiled in KOH before mounting. This difference in mounting accounts for the larger number of lateral spines showing on figure 5, as the larva was flatter owing to the absence of the internal organs.

FIG. 1. Dorsal view of first stage larva.
,, 2. Dorsal view of second stage larva.
,, 3. Ventral view of second stage larva.
,, 4. Dorsal view of third stage larva (Endoparasitic period).
,, 5. Dorsal view of third stage larva (Free living period).

EXPLANATION OF NUMBERS.

(1) Cerebral ganglia or brain. (2) Alimentary canal passing from the buccal cavity to attachment in caudal vesicle. (3) Imaginal buds of prothoracic legs. (4) Imaginal buds of metathoracic legs. (5) Gonads. (6) Mandibles. (7) Mesothoracic spiracles. (8) First pair of abdominal spiracles. (9) Seventh pair of abdominal spiracles. (10) Lateral spines. (11) Dorsal spines.

(I) Metathorax. (II) Eighth abdominal segment with the ninth and 'tenth' inserted into it. (III) Caudal vesicle. (IV) Ring-like structure representing the tenth abdominal segment. (V) Head.

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Imperial College of Science and Technology,
Biological Field Station, Slough, Bucks.
November, 1934.

SYSTEMATIC NOTES UPON BRITISH AQUATIC COLEOPTERA.

BY FRANK BALFOUR-BROWNE, M.A. (OXON. ET CANTAB.), F.R.S.E.,
F.Z.S., F.R.E.S., F.R.M.S.
(formerly Professor of Entomology at the Imperial College of Science, London).

PART X.* *HYDROVATUS, BIDESSUS* AND *HYPHYDRUS.*

Hydrovatus was taken out of *Hydroporus* by Motschulsky (1855, p. 82), but his description of the genus does not contain a single character upon which it would be possible to separate it from other Hydroporinae. Motschulsky apparently created the genus for two of his own species, *castaneus* and *obtusus*. Of the former he says 'de la forme convexe de l'*Hydr.* (sic) *cuspidatus* . . .' and of the latter 'un peu plus petit que l'*H. cuspidatus*.' Since it is obvious that he left *cuspidatus* in *Hydroporus* and only included these two eastern Asiatic species in what is really an undefined genus, the question arises, should *Hydrovatus* remain? Schaum (1868) created the genus *Oxynoptilus* for *cuspidatus*, and he clearly defines his genus. Seidlitz (1886, p. 36) recognises Schaum's genus and gives '*Hydrovatus* Sharp' as a synonym, and in a footnote he says: 'In Motschulsky's Études Entomologiques, 1855, p. 82, is already the generic name *Hydrovatus*, but the genus was not characterised, so that this name can have no more priority than a name in a catalogue.' I do not feel that this is the correct view, since, although the genus was badly defined, the two species for which it was created possess the characters of Schaum's *Oxynoptilus* and in modern lists are placed in the same genus as *cuspidatus*. Therefore, I think that *Hydrovatus* must stand, since it complies with Article 25 of the Rules of Nomenclature, which says that so long as the first name 'was published and accompanied by an indication, or a definition or a description . . .' it is valid. This necessitates the genotype being one of the species named in the genus by Motschulsky, and as both appear to be good species, according to Zimmermann (1920), I hereby designate the first, *Hydrovatus castaneus* Motschulsky, as the type.

There is only one British species of the genus :—

Hydrovatus Motschulsky (1855) = *Oxynoptilus* Schaum (1868).
clypealis Sharp (1876).

Bidessus was created by Sharp (1882). He separated the Bidessini from the Hydroporini on the fact that in the former the post-coxae are fused to the anterior abdominal sternum, a peculiarity occurring in no other Coleoptera. Of the Bidessini, *Bidessus* is the only British genus, so that this peculiar character distinguishes the genus from its British relations. So far as I can find, no one has fixed the genotype, and I therefore name *Dytiscus unistriatus* Fab.

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* These three genera were omitted by mistake and should, of course, have commenced the Hydroporinae.

No question arises as to the names of the British species, whose Britannic distribution is interesting. *B. unistriatus* is confined to East Anglia and South-East England, there being no records west of Hants South and none north of Cambridge and Norfolk East. *B. minutissimus* is western, the only records being for Kirkcudbright, Wigtown, Isle of Man and Devon South, and in Ireland, Kerry North and South, Cork Mid and one specimen from Dublin. *B. geminus* is an 'English' species and is frequently abundant. There are records of it from Northumberland South to Cornwall West and Kent East. There is a Co. Down record by Haliday published in the Proceedings of the Belfast Naturalists' Field Club, 1885, Appendix VIII, but this, if correct, appears to have been a chance specimen as, although I collected for a number of years in Antrim, Down and Armagh, I never saw the species and no one else has since recorded it. The British list is as follows :—

Bidessus Sharp (1882).
  unistriatus Schrank (1781, p. 205).
  minutissimus Germar (1824, p. 31).
  geminus Fabricius (1792, p. 199).

The history of *Hyphydrus* is somewhat confused. It is Illiger's genus and its date is usually given as 1807, but in 1802 (p. 237) Illiger was comparing the number of tarsal segments in *Dyticus* and *Hyphydrus* and (p. 293) says : 'One finds in the posterior tarsi [of *Dyticus*] five segments, just as in the anterior tarsi. From this rule, so far, the genus *Hyphydrus* makes the only exception. This is a definition of the genus *Hyphydrus*, which was almost the first to be taken out of *Dytiscus* and included almost all the modern Hydroporinae.' Guérin (1825) states that the genus was established by Illiger in 1804 (Mag. Ins., 1804, p. 8) and others, as I have said, make it 1807, but 1802 is the correct date. An early partition of *Dyticus* was by Fabricius (1801), who named a genus '*Hydrachna,*' to include *D. ovalis* and *gibba* and *hermanni*, the first two being ♂ and ♀ *Hyphydrus ovatus* of to-day and the last, *Hygrobia tarda*. *Hydrachna* had already been used by Müller (1776) for a genus of aquatic Arachnids. Illiger (1802, p. 369) refers to this: 'As *H. gibba, ovalis* and *scripta* † cannot remain bound up with *Hermanni,* I have proposed for them the name *Hyphydrus* and have desired that Fabricius' name *Hydrachna* should be exchanged for something more suitable, if the generic distinction of *Hermanni* from *Dyticus* is established.' Latreille (1817, pp 500, 501) reviewed the difficulty with regard to *Hydrachna* and violently attacked Fabricius: 'M. de Clairville who, by making new divisions founded upon good characters, has cleared up the *hydrocanthares,* has shared my sentiments on the subject of the chaos which Fabricius has produced in the nomenclature but has not had the courage to reject this wrong use of the name "hydrachne" . . .'

Dytiscus ovalis was named by Illiger as being distinct from *D. ovatus* Linnaeus, the main difference between the two, as described by him, being in the dull appearance of the first and the shining smooth condition of the second, and it appears that he has merely described the male and female as separate species. The description of *D. gibbus* by Fabricius also indicates that he described the female of the same species which had the prior name *ovatus* of Linnaeus (1761). In 1810 Latreille made *Hydrachna gibba* Fab. the genotype of the genus, so that our species *H. ovatus* is the species he named.

HYGROBIIDAE.

The family Pelobiidae was apparently so named by Horn (1881), up to which time the genus, known as *Pelobius,* had been regarded as belonging to a sub-family Pelobiini of the Dytiscidae. Sharp, although in his Monograph (1882) he had treated *Pelobius* as belonging to the Dytisci Fragmentati, quickly came round to Horn's view (Trans. Ent. Soc. Lond., 1882, Pt. 1, p. 67).

Thus the family name was founded upon that of the genus, although there is very definite evidence that the name *Pelobius* only orginated with Erichson (1832), who gave, as a synonym, *Paelobius* Schönherr, this author having created the name in 1808. But four years previously Latreille had introduced the name *Hygrobia.* This name replaced *Hydrachna* of Fabricius (1801), which in any case was not available as it had already been used by O. F. Müller (1776) for an Arachnid genus.

There seems to be no reasón why the name *Hygrobia* should have been superseded and, as a fact, a number of authors have retained it. Ganglbauer (1892) pointed out that, as a consequence, the family name must be *Hygrobiidae* and not *Pelobiidae.*

The single European species was described by Fowler (1887) as *tardus* Herbst, but it is also known as *hermanni* Fab., a name which, spelt in that way, is two years younger than *tardus*. In 1775, Fabricius named a species '*Herrmanni*,' a spelling which he repeated when he mentioned that he had named it after Professor Herrmann, and it was not until 1781 that he altered the spelling for both the species and the professor. In his original description Fabricius described '*herrmanni*' as 'statura *D. erythrocephali* . . .' In 1781, p. 295, still giving the size as that of *Hydroporus erythrocephalus*, he mentions *Dytiscus tardus* as a synonym. Olivier (1795) has a figure of '*D. hermanni*,' which is certainly our species, but there is complete confusion in the synonymy, which includes the names *tardus* and *undulatus*, the latter being *Agabus undulatus* Schrank.

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† A species not definitely determined but Zimmermann (1920) gives it, with a query, as a native of Madagascar.

Seeing that the size of *hermanni*, as stated twice by Fabricius, definitely excludes the possibility of its being the species under discussion and since Herbst's description it not unsuitable for it, the name *tardus*, or *tarda*, appears to be the correct one.

The British list, therefore, should be:—

HYGROBIIDAE Ganglbauer, 1892 = *Pelobiidae* Horn, 1881.
Hygrobia Latreille, 1804 = *Paelobius* Schönherr, 1808 = *Pelobius* Erichson, 1832.
tarda Herbst, 1779: not *herrmanni* Fabricius, 1775.

Winscombe Court, Winscombe, Somerset.
December, 1935.

PARASITES FROM RODENTS AND SHREWS IN THE OUTER HEBRIDES.

BY CHARLES ELTON
(Bureau of Animal Population, Department of Zoology and Comparative Anatomy, Oxford University.)

In continuation of a previous survey (Elton, 1934; Hora, 1934) trapping for small mammals was done in August, 1935, at two places in the Outer Hebrides. All specimens were examined carefully for ectoparasites. The fleas (Siphonaptera) were identified by Mr. F. D. Cox, the lice by Mr. Gordon B. Thompson, the mites by Mrs. Margaret Hughes, and the Nematodes by Dr. H. A. Baylis, all of whom I wish to thank for undertaking this work. All the parasites have been or are being placed in the British Museum of Natural History. The original cards with details for each animal are deposited in the Bureau of Animal Population at Oxford.

(1) Thirteen House Mice (*Mus musculus* L.) were trapped on August 21st-23rd along a wall among hay, oats and pasture fields, half a mile from Stoney Field Farm, which lies a mile and a half

south-east of Stornoway, in the Isle of Lewis. In the Hebrides house mice live largely out in the fields during the summer, retiring into buildings in winter. The parasites of these mice were:—

Species.	Nos. taken on each of 11 live *Mus musculus*.	Total nos. taken on 11 live and 2 dead *Mus musculus*.
Fleas (Siphonaptera):		
Ctenophthalmus agyrtes Heller var. *celticus* Rothschild 1922.	9, 3, 2, 1, 1, 1 (5 with 0)	17
Nosopsyllus (=*Ceratophyllus*) *fasciatus* Bosc.	9, 3, 2 (8 with 0)	15
Mites (Acarina):		
Eulaelaps stabularis Koch.	4, 1, 1, 1 (7 with 0)	8
Ichoronyssus carnifex Koch.	'Many,' 5, 4, 3, 1 (6 with 0)	?
Haemogamasus michaeli Oudemans.	2 (10 with 0)	2
Pergamasus hamatus Koch.	1 (10 with 0)	1

H. michaeli was not taken on the thirty-two House Mice trapped along the same wall in 1933, although it occurred commonly in House Mouse nests from Barvas on the other side of the island. All the thirteen mice were examined carefully for the skin-mite, *Notoedres*, but none was found, nor any lice (Anoplura).

(2) Trapping was done on August 8th-14th on the Isle of Pabbay, which lies outside the western end of the Sound of Harris, some four miles from Harris itself. No House Mice were found on the island, but nine Wood Mice (*Apodemus hebridensis* De Winton) and one Pigmy Shrew (*Sorex minutus* L.) were obtained. The mice were living in the walls of old ruined crofts, while the shrew was taken on rocks on the sea-shore just beyond Quidnish. The following parasites were taken on *Apodemus*:—

Species.	Nos. taken on each of 9 live *Apodemus hebridensis*.	Total number.
Fleas (Siphonaptera):		
Ctenophthalmus agyrtes Heller var. *celticus* Rothschild, 1922.	8, 4, 1, 1, 1, 1 (3 with 0)	16
Lice (Anoplura):		
Polyplax serrata (Burmeister).	1, 'eggs,' 'eggs,' (1 unidentified, 5 with 0)	2
Mites (Acarina):		
Eulaelaps stabularis Koch.	12, 2, 2, 1, 1 (4 with 0)	18
? *Notoedres* sp.	(8 with 0)	?
Roundworms (Nematoda) Larvae on fur.	'Ab.,' 'Few' (7 with 0)	?

One mouse had on one front leg the characteristic skin-scabs caused by *Notoedres*, but Mrs. Hughes did not find any actual mites in the material brought back. This mite was found on *Apodemus* at Stornoway in 1933 (Hora, 1934). The Nematode larvae were remarkable. Dr. Baylis informs me that they are unknown rhabditiform larvae: it is not known whether they are a stage in some internal parasite or an accidental swarming of the larvae of some free-living species. They were found once or twice on *Apodemus sylvaticus* near Oxford, in similar circumstances. Some ♀♀ *Syphacia* sp. were found in the intestine of the only *Apodemus* dissected. These roundworms are not further identifiable in the absence of males.

The Pigmy Shrew had one small flea on it, which was lost in transit, and no mites.

The distribution of fleas on different hosts and places in the Outer Hebrides, so far as is yet known, is shown in the table below. This includes the results of my two surveys, and some notes published by Scott (1915) on a collection of insects from Barvas made by Balfour-Browne's expedition in 1914.

	Apodemus hebridensis.	*Mus musculus.*	*Rattus norvegicus.*	*Sorex minutus.*
Nosopsyllus (=*Ceratophyllus*) *fasciatus.*		S	S B	
Ctenophthalmus agyrtes var. *celticus.*	S B P	S B	B	
Typhloceras poppei.	S	B		
Doratopsyllus dasycnemus.	B			?B ?P

S = Stornoway, Lewis. B = Barvas, Lewis. P = Pabbay, South Harris.

Doratopsyllus is a shrew flea and no doubt was derived from *Sorex minutus*, which is hard to trap. There are no Brown Rats and probably no House Mice on Pabbay. The apparent absence of the vole flea, *Malareus* (=*Ceratophyllus*) *penicilliger* from Lewis and Pabbay is of some interest. In fact the absence of voles (*Microtus*) from Pabbay is of itself rather surprising, since they occur abundantly only a few miles away on North Uist, where Kinnear collected *M. penicilliger* from *Microtus agrestis* (Waterston, 1906). The absence of this flea from the collections so far made in Lewis and Pabbay suggests that there have never been any voles in these islands, for *C. penicilliger* is quite common on

Apodemus sylvaticus populations on the mainland of Great Britain. I am aware that a number of considerations might upset this conclusion, but wish to point out the importance of making further collections of Outer Hebridean rodent and shrew parasites, which may throw light on the former history of the fauna. Pabbay lies on the Uist submarine shelf of Harris Sound, and yet its fauna resembles that of Lewis in the absence of voles and of *C. penicilliger*.

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University Museum, Oxford.
January 14th, 1936.

THE BRITISH TULLBERGHINAE. Pt. II.

(FIGS. 12—25.)

BY RICHARD S. BAGNALL, D.SC., F.R.S.E.

This part is continued from Vol. LXXI, p. 173, and deals with the genera *Neotullbergia* and the first section of *Metaphorura* m. The latter genus is diagnosed for the reception of *Tullbergia affinis*, *T. bipartita* and their allies as distinct from *Mesaphorura krausbaueri* and its allies. Further species of the genera *Paratullbergia*, *Neonaphorura* and *Stenaphorura* (see Pt. I) have been discovered and are described in an Addendum. The following species are herein described :—

Neotullbergia laingi, *Metaphorura börneri*, *Paratullbergia macdougalli*, *Neonaphorura anglicana* (for *N. duboscqui* Bagn. *nec* Denis) and *Stenaphorura absoloni* spp.n., whilst the true *Neonaphorura duboscqi* is recorded as British.

In view of the material I have now had the advantage of studying I find it necessary to found the genus *Metaphorura* as indicated above. Doublet 4 of my key to the British groups and genera (pp. 166-167) should be deleted and the following substituted.

4. AH simple 5
AH each furnished with two smaller branches; anal segment without medio-ventral process (fig. 12). PAO as in *Mesaphorura*, either simple or complex (fig. 14) .... Genus *Neotullbergia* Bagn.

5. Species generally larger with AH longer and stronger. *Anal segment furnished with a medio-ventral process. PAO with not more than 20—24 vesicles*, which may be regular or irregular in form (and lying at a greater slope than in *Mesaphorura*) or complex when the vesicles are

bifurcate (fig. 17) and never 'double-headed' as in *Neotullbergia* and *Mesaphorura* .... Genus *Metaphorura* nov.

Species generally more minute with AH comparatively smaller and anal segment *without* medio-ventral process. PAO with numerous vesicles ((30) 40—80) which are more or less elliptical in form and lie close together at only a slight slope to the axis; if complex they take the form of two rows of double-headed vesicles. Genus *Mesophorura* (Börn.) Bagn.

Genus *Neotullbergia* Bagnall, 1935.

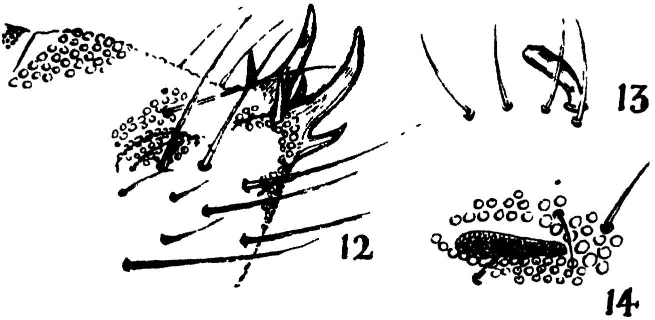
Ann. Mag. Nat. Hist. (10), XV, p. 241.

This genus is chiefly characterised by the branched AH. (fig. 12), a feature that is not exhibited in any other known genus, and the two species as yet known exhibit both types of PAO peculiar to the allied genus *Mesaphorura*. When dealing with the species of *Mesaphorura* I propose to bring forward some interesting facts regarding the geographical distribution of the two types.

TABLE OF SPECIES.

Size smaller (0.7 mm.); PAO simple, with 50—60 elongate vesicle set at less than a right angle to the axis .... *N. tricuspis* (Börn.).

Size larger (c. 1.0 mm.); PAO complex, composed of two series of 40 or more double-headed vesicles as in *Mesaphorura collis*, etc. (fig. 14) .... *N. laingi* sp.n.



FIGS. 12—14. *Neotullbergia laingi* sp.n. (12) Last abdominal segment showing anal horns; (13) sensory rod on underside of third antennal segment; (14) postantennal organ.

(10) **Neotullbergia laingi** sp.n. (Figs. 12-14).

The above remarks and table together with accompanying figures will serve to distinguish this rare species. I am hopeful of securing further material to enable me to describe the finer details of its sensory organs and the disposition of the pso., etc.

E. YORKS, Danes Dyke, viii.34, and Speeton, 30.ix.34, and SCOTLAND, Corstorphine Hill, Edinburgh, 3.ii.35, single examples only. The Speeton example was found amongst several hundred examples of *Stenaphorura denisi,* whilst the Edinburgh example was found with several examples of *S. denisi* and *S. absoloni* sp.n.

Genus **Metaphorura** nov.

At once characterised by the medio-ventral process of the anal segment (figs. 15 and 16). The sense organ of Ant. III in the species known to me agree in the possession of three somewhat tall conical papillae, which will be figured in the next part.

The vesicles of the PAO are comparatively few in number and when complex they are bifurcate and set at a considerable slope to the axis.

The genus may be divided into two sections as follows :

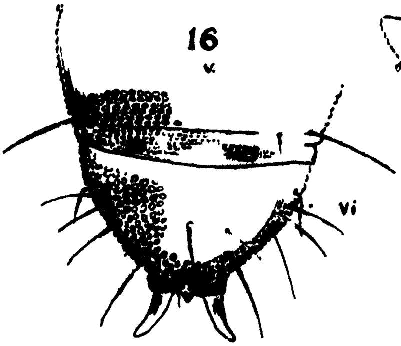
PAO with vessels complex, bifurcate .. .. A
PAO simple .... B

SECTION A. TABLE OF SPECIES.

Pso. 20. Abd. VI longer and the AH set close together (fig. 16) .. *M. borneri* sp.n.
Pso. 18, the pair on Th.i being absent. Abd. VI short and the AH widely separated (fig. 15) .... *M. bipartita* Handsch.

(11) **Metaphorura borneri** sp.n. (figs. 16-17).

This distinct species is of approximately the same size and form as *M. bipartita* Handsch., the only other known species of the section. The vesicles of the PAO are of the same type but apparently more heavily formed (fig. 17). It has the full complement of pso., whereas *bipartita* lacks the pair on Th.i The AH are longer and stronger than in *bipartita* and apparently more strongly curved; they are carried on two papillae set close together and contiguous. Abdomen VI is much longer than in *bipartita* and has a different arrangement of bristles (fig. 16).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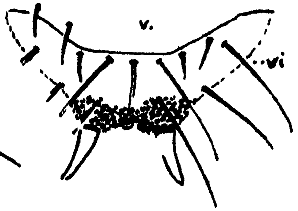
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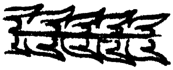
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FIG. 15. *Metaphorura bipartita* (Handsch.). End of abdomen (after Handschin). FIGS. 16—17. *Metaphorura börneri* sp.n. (16) End of abdomen and (17) details of PAO vesicles.

EDINBURGH district: Corstorphine Hill and neighbourhood, common, iv.35 onwards; fields round Edinburgh, occasionally, iii-vii.35; Cramond Coast, 1 example, 17.iii.35; Pentlands, near Lothianburn, at *c.* 1,000 feet, xii. 34, 1 only.

PERTHSHIRE: Gleneagles, several examples, and Crieff, under stones, viii.34.

(12) *Metaphorura bipartita* (Handsch.) (fig. 15).

Tullbergia bipartita Handschin 1920, Verh. Naturf. Ges. Basel, XXXII, p. 30, figs. 65-70; 1929, Die Tierwelt Deutschlands, 16, Urinsekten oder Apterygota, p. 52, figs. 63 and 83-85; Davies, 1934, Ent. Mo. Mag., LXX, p. 92.

Recorded from the high Alps (Handschin), the South of France and from the slopes of Tryfaen, N. Wales, at 3,300 ft. (Davies).

In view of the recognition of a second allied species (*M. borneri*), it is to be regretted that Welsh examples are not available for comparison, but Dr. Davies hopes to secure fresh material in the near future.

ADDENDUM I.

(13) **Paratullbergia macdougalli** sp.n. (figs. 18-19).

Length 0.9—1.05 mm.

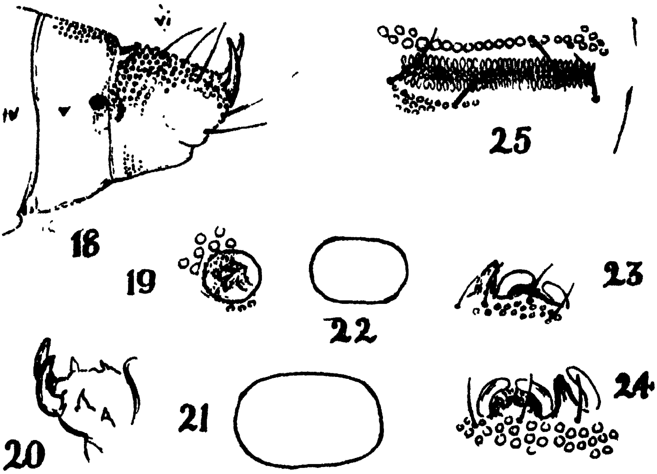
This species comes nearest to *P. carpenteri* m. and may be distinguished as follows:—

1. Ant. IV is much as in *carpenteri*, but in the specimens before me I can only distinguish two subapical and one mid-lateral curved sense-rods. The sense-organ of Ant. III does not appear to be quite typical of the genus and requires study. The PAO is much as in *carpenteri*.
2. Pseudocelli 14, distributed as follows: 1 + 1 in front of PAO, 1 + 1 on hind margin of head, and 1 + 1 on each of the body segments Th.ii, iii, Abd. I, IV and V, thus differing from both *concolor* and *carpenteri* in the possession of pso. at the hind margin of head.
3. The last abdominal segment is without the tubercular swellings seen in both *concolor* and *carpenteri* and the tubercles are arranged in more or less regular rows. There is, however, a pair of arcuate dorsal depressions (the lips of which are slightly raised) along the posterior margin, each of which is situated immediately behind the pso. of Abd. V (fig. 18). Viewed dorsally segment VI is sharply narrowed before end; the AH are not so stout and are less strongly curved than in *carpenteri* and more as in *concolor;* they are approximately 1.4 times as long as the hind foot.

EDINBURGH district: a few examples from Corstorphine Hill, 6.iv.35. YORKS: Ravenscar, a single example only, ix.34.

Genus *Neonaphorura* Bagn.

In view of the discovery of an example that appears to be the true *N. duboscqi* of Denis, I now describe the Yorkshire examples under the name of *anglicanus*.



FIGS. 18, 19. *Paratullbergia macdougalli* sp.n. (18) End of abdomen; (19) one of the pseudocelli. FIGS. 20, 21. *Neonaphorura duboscqi* Denis. (20) End of abdomen and (21) size of PAO area compared with 22. FIGS. 22, 23. *N. anglicanus* sp.n. (22) Size of PAO area compared with 21 and (23) sense organ of third antennal segment. FIGS. 24, 25. *Stenaphorura absoloni* sp.n. (24) Sense organ of third antennal segment; (25) Postantennal organ.

TABLE OF SPECIES.

Ant. sense-organ III with three well-developed conical papillae; PAO comparatively larger (fig. 21); superior AH stouter and strongly upturned (fig. 20), 2.5 times the length of the hind foot (lower margin) ...... *N. duboscqi* Den.

Ant. sense-organ III otherwise (fig. 23); PAO comparatively smaller; superior AH more slender and not strongly upturned (fig. 4), not more than 2.0 times the length of the hind foot .... *N. anglicanus* sp.n.

(14) *Neonaphorura duboscqi* (Den.) (figs. 20-21).

Tullbergia duboscqi Denis, 1932, Arch. Zool. Exp. et gen., 74, 6, p. 366, figs. IV, 1-10; *Neonaphorura duboscqi* Bagnall, 1935, Ann. Mag. Nat. Hist. (10), XI, p. 241.

The specimen now recorded is badly mounted in balsam and the antennae and feet are not available for study. The form of the AH, however, and the relatively large PAO so closely agree with Denis's figures that I can only refer it to this species.

S. DEVON: Petit Tor Bay, near Babbacombe, 1 example (*L. Hirst*). First British record.

(4) **Neonaphorura anglicanus** sp.n. (figs. 4, 5, 22 and 23).

Neonaphorura duboscqi Bagnall (*nec* Denis), 1935, Ent. Mo. Mag., LXXI, p. 169, figs. 4 and 5.

With the characters shown in table. The species would appear to be almost the same length as *duboscqi* but more slender in build, as, whilst the PAO is comparatively much smaller than in *duboscqi*, it bears the same relative length (0.4) to the basal breadth of the antenna in both species. The AH are as in fig. 4 (p. 170), the superior pair not being upturned and only 1.8—2.0 times the length of the internal margin of the hind foot. The sense-organ of Ant. III is as shown in fig. 23.

Genus *Stenaphorura* (Abs.) Bagn.

In the following additional notes a record of what appears to be the true *S. quadrispina* is made and also further records of *S. lubbocki* m.; the full synonymy of *S. axelsoni* is added and *S. absoloni* sp.n. is described. This last-named species differs from all others in the type of its PAO.

The continued accumulation of material will doubtless bring to light further species and will also, I think, enable one to develop a scheme of classification based upon simple surface characteristics such as the chaetotaxy and nature of granulations.

(7) *Stenaphorura axelsoni* Bagn.

Tullbergia quadrispina (an spec. nov.?) Axelson, 1906, Acta Soc. Fauna et Fl. Fenn., 28, No. 2, p. 10, figs. 1-4; ? *Tullbergia q.* Axelson, 1912, Acta Soc. Sci. Fenn., XL, No. 5, p. 96, pl. VIII, figs. 12-13; *Stenaphorura axelsoni* Bagnall, 1935, Ent. Mo. Mag., LXXI, p. 172.

The length of my examples varies from 0.8 to 1.05 mm. The granulations of the integument are coarse, and in an example of approximately 1.0 mm. in length the dorsal rows of Abd. V number 14-16. The superior AH are comparatively slender and are approximately 0.5 the dorsal length of Abd. VI, whilst the hind-foot is c. 0.5—0.55 the length of the superior AH.

(6) *Stenaphorura quadrispina* Börn.

I have taken a small example (recorded below) measuring 0.53 mm. in length which agrees well with Börner's description and his figures of the sense-organ of Ant. III and PAO (with 25 easily distinguished vesicles set at right-angles to the axis). The PAO is small and only about 0.6 the length of the breadth of the first antennal segment. The last abdominal segment is at least as long as V; the superior AH are slender and carried erect and are c. 0.44 the dorsal length of Abd. VI. The granulations of the integument are coarse and the larger of the dorsal series of Abd. V number 6-8 rows. The claws are substantially shorter than the superior AH but are set at such angles as to make exact measurements impossible.

SCOTLAND: Ben Vorlich (Dumbartonshire), 1 example at about 1,000 feet, 28.vii.35. Very wet weather made collecting difficult.

(9) *Stenaphorura lubbocki* Bagn.

Further records: DUMBARTON, Ardlui, several examples, 28.vii.35, and ARGYLL, one example at foot of the Cobbler, 3.viii.35. In both cases wet weather ruined the possibility of satisfactory collecting.

(15) **Stenaphorura absoloni** sp.n. (figs. 24-25).

Differing from known species of the *axelsoni* group in the structure of the PAO. The species is somewhat smaller than *S. denisi* m. and has the sensory organ of Ant. III as described and figured for that species. The AH and Abd VI are much as in the *axelsoni* group; the superior AH are long, strong and erect and are approximately 0.7 the dorsal length of the segment between basal margin and the base of the AH; the inferior AH are weak and only 0.4—0.5 the length of the larger pair. The length of the hind foot is c.0.65 the length of the superior AH. The granulations of the integument are much finer than in *axelsoni* and the rows of the larger granulations of Abd. V number 22—24.

The sense-organ of Ant. III is much as described for *S. denisi* (fig. 24). The PAO is somewhat broad and regular in form *and comprises two series of* 26—34 *double-headed vesicles* in which it is distinguished from all known forms (fig. 25). The full complement of 10 + 10 pso. are present.

EDINBURGH district: not uncommon on Corstorphine Hill, 3.ii.35 and onwards, accompanied by *S. denisi*, etc.

Edinburgh.
26th November, 1935.

Further British records of Anthicus tobias Mars.—On October 12th, 1935, while collecting on a large rubbish dump near Mill Hill, I took some specimens of *Anthicus tobias* under old sacking. On October 20th Mr. W. Steel and I took further specimens, and again on the 29th. The beetle was extremely plentiful, as many as a dozen being found in one piece of sacking; occasionally a single specimen occurred under a stone. On December 30th, however, I could not find one. The first British record of this species is that of E. C. Bedwell, at East Malling, Kent (Ent. Mo. Mag., 71, 1935, pp. 41, 78). It was, however, previously taken by H. Britten in some numbers at Barton Moss, Lancs. (21st Ann. Rep. Lancs. & Cheshire Fauna Committee, Dec. 1935, p. 27). One might hazard a guess that it will soon turn up on other rubbish dumps and similar situations. The Mill Hill dump furnished three specimens of an uncommon introduced earwig, *Anisolabis annulipes*, as well as the domestic cockroach, *Blatta orientalis* L., and the house cricket in plenty. Not far away, in a heap of rotting potatoes in sacks, I discovered any number of the little Histerid *Carcinops 14-striata* Steph.—K. M. GUICHARD, 60 Birkbeck Road, Mill Hill, N.W.7: *January 13th*, 1936.

The Habitat of Anoncodes melanura L. (Coleoptera, Oedemeridae).—In view of the records of the occurrence of *Anoncodes melanura* L. in the London district, that have been published in recent numbers of this Magazine, the following notes on cases which have come to the notice of the Forest Products Research Laboratory, Princes Risborough, may be of interest.

In July, 1932, large numbers of adults and larvae of this beetle were found in the flooring of a shed in the Docks at Devonport. The floor blocks which were attacked occupied a position next to a brick wall below the damp course and were moist and decayed; the timber had not been treated with a preservative.

In the beginning of August, 1933, a specimen of the beetle was sent for identification with the statement that it had emerged from the woodwork of a built-in counter against the outside wall of premises in Woodford Green. No information was available upon the condition of the timber, but it is probable, from its position that it was decayed by fungal attack.

Three interesting records of the occurrence of the insect were noted in 1934. In the first case, *Anoncodes* was reported to have emerged in numbers from a consignment of Quebec birch logs in the end of June, on arrival in the London Docks. The beetles were discovered before the logs, imported in the round, were unloaded from barges; and it therefore seems legitimate to conclude that the insect was in no way responsible for damage to this timber. It is probable that it originated from some other source, *e.g.* decayed piling in the vicinity or from the woodwork of the barges, and had alighted on the surface of the birch. The logs were not inspected by the Laboratory, but insect damage, if present, is likely to have been caused by the Longhorn beetle, *Phymatodes testaceus* L., which superficially closely resembles *A. melanura* in general appearance, and which indeed was sent at the same time for identification from another consignment of Canadian birch stored on the premises of a timber importer in London.

The presence of *Anoncodes* in the London Docks, where adults were collected in numbers by the Laboratory in July, 1934, is of special interest in view of accounts in the Proceedings of the 34th and 35th Annual Conventions of the American Railway Engineers' Association for 1933 and 1934, in which *A. melanura*, the so-called Wharf Borer, is cited as being responsible for extensive damage to timber piling in New York Harbour and Tidal Estuary. It appears that the insect was most prevalent at a height of 2—4 ft. above the line of permanent saturation by the water. While it is suggested that the damage is chiefly confined to timber in which decay has already commenced, there is some doubt, according to Dr. T. E. Snyder of the U.S. Bureau of Entomology, as to whether the insect may not also occur in sound wood. It is stated in the above publications that, once this borer attacks timber, deterioration is very swift and the destruction is much more rapid than in timber in which fungal infection is the sole destructive agent. Other records in these reports refer to damage by larvae of *A. melanura* to wharves, bridges, telegraph poles, conduits, paving blocks and woodwork of buildings, etc.

The third record during 1934 concerns the presence in the end of June of numbers of adults of this insect in the basement of a timber store in Gray's Inn Road, London. Subsequent examination of the structural timbers [identified as Pitch pine (*Pinus* sp.)] in the basement revealed that they were in an advanced stage of fungal decay and were attacked by *Anoncodes*. It is interesting to note that the basement was built over an underground river and was permanently in a damp condition.

In 1935, two instances of the occurrence of *Anoncodes* were recorded by the Laboratory. In the first, the beetle was again erroneously held responsible for injury to timber in a timber yard in the London district. Beetles were found in July on the surface of stores of pear and partridge woods. Samples were examined but no evidence of insect attack found. Again the beetle had origineatd from some other source, but its appearance caused considerable alarm to the owners of the timber on which it was found.

In the second case, this species was responsible for extensive damage to the launching ways of a slip in the Docks at Portsmouth. A sample of the timber from which adults and larvae were taken was examined and identified as deal (*Pinus sylvestris*), severely damaged by fungus. No preservative had been used in the treatment of the launching-ways.

Two instances remain to be noted in which damage was caused by Oedemerid larvae in decayed timber, although their identity was not definitely established as *A. melanura*. One case refers to extensive injury to softwood capping of the Marine Parade at Folkestone. The timber was *P. sylvestris*, and had originally been creosoted some twenty years ago, apparently inefficiently, since on examination of samples of the attacked wood only few traces of creosote were found. Properly impregnated timber would not have been attacked by fungus within twenty years.

The other instance concerns the presence of Oedemerid larvae in decayed oak taken from a yacht in May, 1934, which for the preceding nine months had lain on a river bank and had floated only during spring tides. The larvae were discovered above the water-line. This habitat corresponds closely to that in which Schedl (1934) found *A. melanura* — a record which is commented upon by Mr. Laing.

The general conclusion to be drawn from the above records is that the larva of *A. melanura* is not a primary pest of sound timber, but bores in decayed wood which is in a damp condition. It appreciably accelerates the destruction of timber in which fungal decay has already started. The records of the occurrence of the insect in this country suggest that it is not confined to wood which is wetted by salt water only. The explanation of its apparent association with sea-water, so frequently cited in literature, is likely to be found in the common use of timber for piling, groynes, etc., on the sea-shore and in the estuaries of rivers. In such places the timber is easily accessible for frequent examination. On the other hand, timber used in underground structures cannot be easily examined, and it is only when the beetles appear in numbers in the open that attention has in the past been directed to their presence. It should, however, be noted that according to Snyder, quoting E. A. Schwarz: 'Larvae have been found in the wood at the bases of telegraph poles where dogs had urinated, also in the wood of fences similarly saturated. Wood wetted with salt water or urine seems more liable to attack.'

Further information is therefore desirable upon the occurrence of *Anoncodes melanura* and its larvae, together with data upon the species of timber concerned, its condition in relation to the presence or absence of fungal decay, and the situation in which it was found.

The writer is indebted to Mr. W. A. Robertson, Director of Forest Products Research, for permission to publish these records. — R. C. Fisher, B.Sc., Ph.D. (Entomology Section, Forest Products Research Laboratory, Princes Risborough, Aylesbury, Bucks: *December 18th*, 1935.

***Supplementary notes on Anoncodes melanura* L.**—The following details of my personal experience of the distribution and habits of *Anoncodes melanura* L. may be regarded as a supplement to the very interesting notes on this beetle which appear in our Magazine for last month, as well as in the current number.

When, under the auspices of the late Mr. G. C. Champion, I turned my attention to the Coleoptera as long ago as 1870, almost the first member of the Order that came under my notice was *Anoncodes melanura*. In that year, and for several successive summers, it was to be met with in large numbers, running and flying actively in the sunshine over the wood-blocks—chiefly old pine ship-timber—with which certain parts of the dockyard at Sheerness were then paved. Specimens were also frequently observed on the pavements, &c., in the town, as well as on Umbelliferous flowers on the Sheppey Cliffs, where its superficial resemblance to the large pallid *Cantharis livida* L., its frequent companion in this situation, was very striking. In subsequent years the beetle occurred to me in equal abundance in the dockyards at Chatham and at Keyham, Devon (Ent. Mo. Mag. XII, p. 109), breeding in wood-block pavements similar in character to those at Sheerness. It was also met with commonly in all its stages in the summer of 1879, in the pine skirting-boards of the esplanade at Dovercourt, Essex, in company with the weevil *Codiosoma spadix* Herbst in great abundance (l.c., XVI, p. 40). More recently I have taken both these beetles in the 'groynes'—which are of oak, if I remember rightly—at the well-known old 'Salterns' at Lymington, Hants.; and casual specimens of *Anoncodes* have occurred to me at Woking and Oxford, mostly about old railway-sleepers used as fences.

In the Champion collection of European Coleoptera, now at the Natural History Museum, there are eight specimens of *A. melanura* taken by myself at Gibraltar—again in a dockyard—and two from the Piraeus near Athens. There are also specimens from Marinella, Sardinia, and from Tangier, taken by Mr. Champion himself.

From Tasmania I have a specimen of the insect, taken by myself on January 10th, 1903, on a wall near the wharf at Hobart. But the most interesting record in my experience comes from so remote a locality as the North Island of New Zealand. In November, 1902, the late Major T. Broun, the Government Entomologist of the Dominion, gave me a beetle that I identified at once as *A. melanura*, of which he had found a number burrowing into the timber of the Queen's Wharf, Auckland, where they had caused an appreciable amount of damage. This wharf is chiefly built of 'hardwood' (*Eucalyptus*) timber, which had been imported from Australia and Tasmania (*cf.* G. M. Thomson, The Naturalisation of Animals and Plants in New Zealand, p. 296).

Mr. F. Laing kindly informs me that the Natural History Museum possesses specimens of *A. melanura* from Syria, Shanghai (possibly taken there by myself), Corea, Japan (several localities), South Africa, Brazil and the Argentine, Costa Rica, California and the Eastern United States—all, or nearly all, localities situated on the coasts of their respective countries. This almost world-wide distribution would appear to indicate the frequent transport of the beetle by commerce to the most remote parts of the globe, as well as to unusual powers of adaptation to its surroundings wherever it may find itself landed.—James J. Walker, Aorangi, Lonsdale Road, Summertown, Oxford: *January 13th*, 1936.

Coleoptera at Higham, Kent.—Being in London for the week-end, I went on October 13th to Higham Railway Station and spent the day investigating heaps of weeds which had evidently been recently raked out of a ditch a few hundred yards beyond the church, immediately beyond the railway line to Port Victoria. There was abundance of insect life in the heaps, but I only brought away the following:—**Telmatophilus brevicollis* Aubé, which was fairly common; I had never seen it in the field before; *T. caricis* Oliv.; **Atomaria fimetarii* Hbst., one only; **Anisosticta 19-punctata* L., quite common; *Micraspis 16-punctata* L., in swarms; *Phytonomus adspersus* F.; *Stenus juno* F.; **S. latifrons* Er.; *Alianta incana* Er.; *Homalium caesum* Grav., fairly common; *Cyphon variabilis* Thunb.; and **Haltica palustris* Weiss. On the way from the station to the church I sifted some roadside cut-grass and obtained a few **Quedius obliteratus* Er. and *Q. cinctus* Payk. with swarms of *Stilicus orbiculatus* Payk. (=*affinis* Fowler) and *S. rufipes* Germ. The six specimens marked * are not included in Commander Walker's Rochester List (1897—1900), though the collecting-ground was well within the six-mile radius from Chatham Railway Station, to which area this list was confined.—T. Hudson Beare, 10 Regent Terrace, Edinburgh: *January 4th,* 1936.

A note on some Co. Antrim Coleoptera.—On September 3rd and 4th, 1935, while collecting at Soldierstown and Gawley's Gate, on the shores of Lough Neagh, we took the following beetles, those marked with an asterisk being apparently additions to the county list of Coleoptera.

Agonum obscurum Herbst., *Bembidion doris* Panz. and *B. bipunctatum* L. under stones at Lough Neagh. *Noterus clavicornis* De G., plentiful in the canal at Soldierstown. *Rhantus exoletus* Forst. **Dytiscus circumcinctus* Ahr., five specimens. **Acilius canaliculatus* Nic. and *Hydroporus angustatus* Sturm, in a drain at Gawley's Gate. *Hydrochus elongatus* Schall., one at Soldierstown. **Paederus riparius* L., two swept from grass at edge of drain, Gawley's Gate. *Phyllodecta vitellinae* L. common at Gawley's Gate, and one or two at Soldierstown. *Galerucella calmariensis* L., common. *Soronia grisea* L., one at Gawley's Gate. *Cryptorrhynchus lapathi* L., two beaten from osiers at Gawley's Gate.

Various common species were seen and taken, including a rather variable series of *Agonum marginatum* L. (see also 'Irish Naturalist's Journal,' Nov. 1935, pp. 310—311).—W. M. Crawford, Belfast; Eugene O'Mahony, Dublin: *January 10th,* 1936.

New Haliplid records for Southern Ireland.—Through the kindness of Mr. W. M. Crawford and Mr. E. O'Mahony, I am informed that the following records of Haliplidae are new for the counties and vice-counties concerned in the southern half of Ireland. It seems therefore advisable to put them on record. I have also added in brackets after each county or vice-county its number on the printed typomap, for the benefit of those who use this method of recording distribution. I personally am responsible for the identifications, but I think Professor Balfour-Browne has seen some of the specimens.

Waterford (WA 145): *Haliplus fluviatilis* Aubé, August, 1931, R. Suir, near Kilsheelan. *H. nomax* B-Browne, August, 1932, R. Suir, near Kilsheelan, R. Mahon, near Kilmacthomas. *H. wehnckei* Gerh., August, 1932, one sp., R. Tay, Stradbally.

Wicklow (WI 126): *H. flavicollis* Stm., August, 1935, R. Shillelagh, at Shillelagh.

Kilkenny (KK 129): *H. fluviatilis* Aubé, August, 1931, R. Nore, near Kilkenny, one specimen. *H. nomax* B-Browne, August, 1932, lake, Bessborough House, Pilltown; R. Pill, Pilltown.

Wexford (WX 127): *H. fluviatilis* Aubé, August, 1935, R. Slaney, Newtonbarry. Also *H. nomax* B-Browne.

Tipperary South (ST 144): *Brychius elevatus* Pz., August, 1931-2, R. Suir, near Kilsheelan; R. Anner, Anner Castle, near Clonmel. *Haliplus obliquus* F., August, 1931, Killenaule peat-bog; 1935, peat-bog near Derryvella. Also *H. confinis* St. from this latter locality. *H. flavicollis* St., August, 1935, R. Anner, Anner Castle. *H. fluviatilis* Aubé, August, 1931-2, R. Suir, Suir Lodge, near Kilsheelan. *H. wehnckei* Gerh., August, 1931, R. Anner, Anner Castle; peat-bog, Killenaule; R. Suir, near Kilsheelan; millstream near Clonmel; August, 1932, field-pond, Skeheenaranky. *H. ruficollis* De G., August, 1931, ditch by R. Anner, Anner Castle; peat-bog, Killenaule; field-pond, Skeheenaranky, August, 1935, peat-bog, Derryvella. *H. immaculatus* Gerh., August, 1931; peat-bog, Killenaule. *H. lineatocollis* Marsh, August, 1931, R. Suir, near Kilsheelan; R. Anner, Anner Castle.

Tipperary North (NT 143): *H. ruficollis* De G., August, 1935, stream, Ballyeiragh Bridge, near Portumna.

Queen's County = Leix (QC 130): *H. flavicollis* Stm. and *H. nomax* B.-Browne, August, 1935, R. Barrow, near Carlow.

Galway South (or East, SG 140): *H. obliquus* F., August, 1935, Shannon Navigation, near Portumna, and Lough Derg near Portumna. The L. Derg specimens are very prettily and unusually marked for Britannic specimens of this species. Zimmermann, in his 'Die Halipliden der Welt' (Entom. Blätter, 1924, p. 69) describes an aberration of this species (ab. *mulleri* Reitt.) in which the black lines on the elytra are present only in rudimentary form. This is the case with these particular specimens, though they appear fully mature. Doubtless they could be paralleled by other Britannic examples, but I personally have never come across this character in so marked a form before. The specimens are also more elongate than is normal for this species. There appears therefore to be a local race of this species in L. Derg, or at any rate something approaching one, like the *pallens* Fowler race of *H. confinis* St. found in Loch Leven, Kinross. *H. ruficollis* De G., August, 1935, peat-bog, Woodford, Portumna district; and Shannon Navigation, near Portumna. *H. lineatocollis* Marsh. also occurred in these last two localities.

Clare (CL 141): *H. confinis* St., August, 1935, Lough Cullaun and peat-cutting, Kilkishen. (Two specimens of *H. obliquus* F. from the former locality exhibit unusual markings for this species.) *H. wehnckei* Gerh., August, 1935, peat-cutting, Kilkishen. Also *H. ruficollis* De G. and *H. lineatocollis* Marsh. from the same locality.

Limerick (LK 142): *H. confinis* St., August, 1932, very common in Lough Gur, near Holy Cross. *H. wehnckei* Gerh., August, 1932, R. Camoge, Knockainy. *H. ruficollis* De G. and *H. immaculatus* Gerh. at the same date common in Lough Gur. *H. lineatocollis* Marsh., same date, R. Camoge,

Cork North (or East, EC 146): *H. flavicollis* St. and *H. wehnckei* Gerh., August, 1932, R. Funshion, Kilbeheny.

Kildare (KD 125): *H. lineatocollis* Marsh., August, 1935, R. Greese, near Carlow.

So often definite information as to the occurrence of quite common and widely-distributed species is lacking from local or county lists, that I do not hesitate to put these notes on record.—REV. E. J. PEARCE, House of the Resurrection, Mirfield, Yorks: *January 19th*, 1936.

Digonochaeta spinipennis Mg. bred from thrush's nest.—I bred three specimens of this Tachinid from an old thrush's nest last summer, the nest having been collected in January. It is known to be a parasite of *Forficula*, and no doubt the host had taken refuge in the nest. Lundbeck records that pupae have been found in nests of *Crabro*, in clover stalks and under bark, all likely hiding places for earwigs. From this and another nest I also bred seven *Docosia fumosa* Edw., four *Sciara glabra* Mg., six *Lasiomma ctenoctema* Kow., one *Tephrochlamys flavipes* Ztt., ten *Chiromyia inermis* Coll., and an unidentified Anthomyid and Cecidomyid, the latter probably from the grass stalks in the nest.—C. H. WALLACE PUGH, Derwent Dene, Oswestry: *January 14th*, 1936.

Societies.

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at The Museum, Tring Park, on November 16th, 1935, Lord Rothschild in the Chair.

Members present:—Lord Rothschild, Sir Edward B. Poulton, Mr. Horace Donisthorpe, Mr. H. Willoughby Ellis, Mr. Jas. E. Collin, Mr. W. J. Kaye, Mr. R. W. Lloyd.

Visitors present:—Mr. Gilbert J. Arrow, Major E. E. Austen, Dr. K. G. Blair, Mr. E. C. Bedwell, Dr. W. T. Calman, Mr. C. L. Collenette, Dr. E. A. Cockayne, Mr. Guy Dollman, Mr. J. C. F. Fryer, Mr. H. M. Edelsten, Major S. S. Flower, Mr. F. W. Frohawk, Prof. G. D. Hale Carpenter, Capt. F. Hemming, Major R. W. G. Hingston, Mr. H. R. Hewer, Dr. A. D. Imms, Dr. Karl Jordan, Mr. F. Laing, Mr. John Levick, Dr. Percy R. Lowe, Sir Guy A. K. Marshall, Dr. S. A. Neave, Mr. Wm. E. F. Nelson, Mr. Chas. Oldham, Mr. Louis B. Prout, Capt. N. D. Riley, Mr. W. Rait Smith, Mr. H. Stevens, Dr. C. D. Sherborn, Mr. W. H. T. Tams, Mr. Hy. J. Turner, Dr. V. B. Wigglesworth, Comm. J. J. Walker, Mr. C. J. Wainwright, Mr. C. G. M. de Worms.

The members and visitors were received by Lord Rothschild at the Museum in the morning and the collections were open for inspection.

The Chairman specially exhibited the following:—85 drawers of the genus *Colias* and 3 drawers of the two British *Colias;* 19 drawers of Palaearctic Cossidae and 12 drawers of the Cuculliine genera *Metopoceras, Cleophana,* and *Calophasia*, 1 drawer of Continental aberrations and 3 of British aberrations of *Arctia caja*, to show that with the exception of the aberrations *petriburgensis* which is purely British, the aberrations of the 'garden Tiger-moth' are similar throughout its range.

Particularly interesting among the exhibits were in the *Colias* a series of 18 bred from the 1 ♀ of *Colias erate* aberration *chrysodona*, which go far to prove *chrysodona* to be a hybrid; the gynandromorphs of *Colias lesbia* and the 2 ♀♀ *Colias croceus* part normal ♀ and part ♀ form *helice*, the unique series of aberrations of *Arctia caja*, the new white *Cossus* from Persia, the long series of *Zeuzera nubila* and *Dyspessa vaulogeri*, the natural hybrids between *Cleophana diluta* × *Cleophana warrionis* and between *Papilio sesostris* × *Papilio orilus*, the gynandromorph *Morpho eugenia uraneis* the melanistic *Argynnis aglaia* and *Argynnis childrenae*, the melanistic *Sphinx ligustri* from Germany and Hemel Hempsted and lastly, the long series of the very rare *Colias chlorocoma*.

Luncheon was served at one o'clock and the large party on this occasion had to be accommodated in two rooms.

After luncheon Mr. Donisthorpe showed a Queen and two workers of the ant *Stenamma westwoodi* West. The Queen had been alive in his observation-nest for 14 years, *i.e.*, from September 20th, 1921, on which date it was sent to him by Messrs. Phillips and Stelfox, to October 2nd, 1935, when she died. He estimated that this ant was probably 18 years old and certainly 16 years old and said that it was the oldest imaginal insect on record. The next oldest adult was recorded by Sir John Lubbock (Lord Avebury) in 1888, *i.e.*, a queen of *Formica fusca* which he stated must have been nearly 15 years old and at that time was the oldest adult insect on record. Moreover the author goes on to say that, what is very extraordinary, she continued to lay fertile eggs, a most interesting fact from a physiological point of view. Fertilisation took place in 1874 at the latest. There had been no male in the nest since then, and moreover he believed that it was well established that queen ants and queen bees are fertilised once for all, hence the spermatozoa of 1874 must have retained their life and energy for 13 years, a fact he believed unparalleled in physiology. Other instances of longevity in insects known to the speaker were recorded by Janet, who kept a queen of *F. alienus* Först. alive for ten years, also specimens of *Claviger testaceus* Preyss. for over four years in his nests.

For the comfort of the members of the party who did not use motor cars, conveyances were provided to conduct them to and from Tring station. The meeting was very successful and entertaining and a most happy and instructive day was spent.—H. WILLOUGHBY ELLIS, *Hon. Secretary*.

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON: *Wednesday, 4th December*, 1935.—Dr. S. A. NEAVE, O.B.E., President, in the Chair.

The Secretary read for the second time the nominations of the Council for Officers and Council for 1936.

The following was elected a Fellow of the Society:—Kenneth Smith, A.L.A., 15 Clarence Drive, Horsforth, nr. Leeds.

The death of Mr. W. G. Bainbridge, elected a Fellow of the Society in 1933, was announced.

The President made an announcement regarding the reorganisation of the Society's publications.

Major H. C. Gunton discussed some phenological records for 1935, illustrating his remarks with lantern slides.

Dr. F. W. Edwards gave a lecture, illustrated by lantern slides, on an ascent of Mount Elgon made during the British Museum Expedition to East Africa, 1934-35.

The following paper was read: 'Odonata collected in Japan, with descriptions of three new species,' by F. C. Fraser.—A. W. MCKENNY-HUGHES, *Hon. Secretary*.

A CONTRIBUTION TO OUR KNOWLEDGE OF THE PSYLLIDAE OF THE HEBRIDES.

BY GEORGE HESLOP-HARRISON, B.SC., PH.D.

During the past three years four visits have been made to the Hebrides in search of Psyllidae, and in all twelve islands—Skye,[*] Raasay, South Rona, Fladday, Longay, Scalpay, Canna, Mull, Coll, Tiree, Barra and South Uist—have been explored. As a result, twenty-eight species of the group are now recorded, ten of which were noted in my article on the Psyllidae of S. Rona which appeared in the 'Scottish Naturalist' for May and June, 1935.

Of the islands named, the last six have been visited in winter only, so that the list as it now appears must be regarded as capable of expansion. However, to compensate for the disadvantages of winter collecting, food-plants were carefully searched for the eggs and larvae of species, known from my researches elsewhere to hibernate in those conditions; such examinations proved unexpectedly fruitful.

In the South Rona list I recorded three Sallow-feeding species, namely, *Psylla salicicola* Först., *P. ambigua* Först., and *P. klapaleki* Sulc, the last only tentatively. It is clear, however, after consulting Sulc's original papers and diagrams that the specimens must be referred to *P. dudai* Sulc, and not to *P. klapaleki* Sulc. In any case the species is new to the British list. Similarly, what was then recorded as *Psylla salicicola* Först. proves to be *P. abdominalis* M.-D., likewise new to our Fauna.

P. salicicola Först. in the same compilation, was identified by means of Edwards' inadequate descriptions and keys (Hemiptera-Homoptera of the British Isles, 1896); that writer describes the species as 'Widely distributed and not uncommon.' I have discovered, however, that neither the treatise on the Psyllidae of the Netherlands (Oversicht der Nederlandsche Psylliden-soorten, H. C. Blöte, 1926) nor the latest Monograph on the Psyllidae in 'Die Tierwelt Mitteleuropas' (Homoptera, Psyllina, H. Haupt, 1935) refer to it. It is true that Löw[†] (1876) lists a *Psylla salicicola* Först. from the Wienerwäld, but *P. salicicola*, as understood by Löw, has been shown by Sulc to comprise two species, *P. dudai* Sulc and *P. klapaleki* Sulc. As far as I can ascertain, none of Förster's original types are in existence, so that what he meant by *P. salicicola* is quite uncertain. In view of these facts, it would be interesting to know what species Edwards places under this name. I shall deal with the *salicicola* problem when further information is available concerning the early stages of that group.

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[*] Skye, Raasay, South Rona, Scalpay, Longay, Fladday and Canna belong to Watson's Vice-county 104; Mull, Coll, Tiree to V.C. 103, and Barra and South Uist to V.C 110.

[†] 'Zur Biologie und Charakteristik der Psylloden nebst Beschreibung zweier neuer Species der Gattung Psylla,' Zoo. Bot. Ges. Wien, Vol. 26.

P. brunneipennis Edw. and *P. hartigi* Flor are now noted for South Rona, thus raising its total to twelve. The number of species collected on the other islands is as follows: Mull 19, Coll 8, Tiree 2, Barra 7, South Uist 8, Skye 18, Raasay 21, Scalpay 6, Longay 7, Fladday 10, and Canna 14--in all twenty-eight species.

1. *Aphalara calthae* Linn.

Not uncommon on South Rona or Canna, but abundantly from Mull. The Rona specimens were soft and more or less teneral, but Mull and Canna specimens were well developed and fully coloured.

2. *A. picta* Zett.

From South Rona, Fladday and Raasay. On Rona the specimens were found on the marsh ragwort, but the Fladday and Raasay examples fed on *Crepis paludosa* and *Hypochoeris radicata*.

3. *A.* (*Anomocera*) *nervosa* Först.

Although larvae and adults were sought on all the islands, only on Tiree and Coll was the insect detected; it occurred as very small larvae on the woody stems of the host, *Achillea Millefolium*, near the ground.

4. *Aphalaroida ericae* Curt.

Abundant on all the islands visited during the summer. In winter, larvae, or the cast skins of a previous generation, were seen on Mull, Coll, Barra, South Uist and Canna, but not on Tiree.

5. *Psylla alni* Linn.

Raasay, Skye, Fladday, and Scalpay. Usually a very common species feeding on alder. At Fearns, Raasay, where no alders grew within half a mile, this species was found on birch. During the 1934 visit to Raasay, it was very abundant on all the alders, to the almost complete exclusion of the other alder-feeding species *P. försteri*, but this year the reverse was true.

6. *P. försteri* Flor.

Raasay, Skye, Fladday, Scalpay; common on alders, usually in the company of *P. alni*.

7. *P. hippophaes* Först.

A few specimens were beaten from its host, *Hippophaë rhamnoides*, growing on Skye near Portree. As the plants are not native to Skye, the insect must have been introduced either as the egg or the very young larva.

8. *P. buxi* Linn.

One or two adults, and a number of galls, in a garden on Raasay.

9. *P. bagnalli* Harr.

Raasay, Fladday, Skye, Mull, South Uist, Barra and Canna. On Raasay, Skye and Fladday the insect was both swept and beaten, but on the other islands (except South Uist) they were always found hibernating on Coniferae. In the latter case, however, searching among grass roots and tussocks of rushes revealed their presence.

10. *P. nigrita* Zett.

Raasay, South Rona, Fladday, Skye, Longay, Mull, Barra, South Uist, and Canna. Either beaten from Coniferae, or from the food plants *Salix aurita* and *S. cinerea*; not abundant on any of the islands.

11. *P. melanoneura* Först.

Raasay and Skye, rather sparingly from hawthorn, but commonly from Coniferae on Mull and Canna.

12. *P. subferruginea* Edw.

Raasay and South Rona on birches, but on Coniferae on Mull.

13. *P. hartigi* Flor.

Raasay, South Rona, Skye, Longay, Scalpay, Fladday and Mull; beaten abundantly from its host-plant, which is birch.

14. *P. sorbi* Linn.

Common on mountain ash; South Rona, Raasay, Fladday, Longay, Scalpay, Skye and Mull; eggs collected from the same tree on the islands of Coll, Barra, South Uist and Canna.

15. *P. peregrina* Först.

Raasay, Skye and Mull; eggs noted on hawthorn, the food-plant, on Canna.

16. *P. mali* Schmdbg.

On cultivated apple on Raasay and Skye; eggs noted on apple on Canna.

17. *P. ambigua* Först.

Adults common on the sallows *Salix cinerea* and *S. aurita* on Raasay, South Rona, Skye, Fladday, Scalpay and Longay. Larvae noted on Mull, Coll, Barra, South Uist and Canna may be referable to this species or the following; I have not yet devised a method of distinguishing the two in the hibernating instars.

18. *P. abdominalis* M.-D.

Rare on Raasay, Fladday and South Rona, but common on

Skye and Longay. In addition, little dark larvae under the lateral buds of *Salices* on Mull, Coll, Barra, South Uist and Canna probably belong to this species.

19. *P. dudai* Sulc.

Sparingly on Skye, South Rona and Fladday; common on Raasay, Scalpay and Longay on *Salix cinerea* and *S. aurita*. One or two were beaten from Coniferae on Mull and Canna, whilst on Coll, Barra, and South Uist they were noted hibernating in rows, close to the ground, on the thicker, lower branches of the sallows named.

20. *P. brunneipennis* Edw.

Common on various species of *Salix*; Raasay, South Rona, Skye, Longay and Fladday. Wintering on Coniferae on Mull.

21. *P. pruni* Scop.

On the island of Mull only, where it was found both on sloe, *Prunus spinosa*, and on Coniferae.

22. *Arytaina genistae* Latr.

From Coll and Mull only. An immaculate winged form, similar to one studied earlier last year on the Culbin Sands, was collected on Coll. Mull forms, however, were all typical.

23. *Psyllopsis fraxinicola* Först.

Common on Raasay, Skye and Mull. Eggs, discovered on Coll on buds of ash trees, almost certainly belonged to this species.

24. *Ps. fraxini* Linn.

Raasay and Skye. As this species appears to be earlier than *Ps. fraxinicola*, only curled and twisted leaves of the galls were found on Mull. Eggs, however, were collected from ash on Coll, Barra, South Uist and Canna in November.

25. *Trioza urticae* Linn.

Common on all the islands, both as adults and larvae.

26. *T. remota* Först.

Abundant as the early stage larvae on Raasay and Skye in July and August last year, when they were detected in 'pit galls' on oak leaves; adults collected on Mull from oak and Coniferae.

27. *T. albiventris* Först.

One dead male in a spider's web on Raasay, but adults common on Coniferae on Mull and Canna.

28. *T. munda* Först.

Collected from Coniferae on Canna.

Armstrong College, University of Durham, Newcastle-upon-Tyne.
January 6th, 1936.

COLEOPTERA FROM THE OUTER HEBRIDES, WITH AN ACCOUNT OF A NEW BRITISH SPECIES, *DERONECTES CANARIENSIS* BEDEL.

BY GEORGE HESLOP HARRISON, B.SC., PH.D.

In October and November last year, I spent a considerable time in research work in the Inner and Outer Hebrides. As far as insects were concerned, most of my energies were directed towards the Psyllidae; nevertheless, other insect groups, more especially the Coleoptera, also received considerable attention.

Unfortunately, as will be remembered, that period included one of the worst storms and the heaviest winds the islands (and indeed the country in general) have ever experienced. As a result, my efforts were rewarded with but few specimens. Practically all attempts to collect were baffled by high winds, and even dredging the lochs for water-beetles was rendered so awkward and unpleasant as to be almost fruitless.

However, as some of the records are new and one species not hitherto recorded for the British Isles has to be brought forward, a list of what was taken is presented here.

The majority of the species were named by myself, but I have to thank Prof. Balfour-Browne, Mr. J. Omer-Cooper and Mr. G. B. Walsh for checking my determinations and for general help. In particular, I have to acknowledge the fact that to Prof. Balfour-Browne I owe the recognition of *Deronectes canariensis* Bedel. I had no opportunity of examining the specimens critically, for after a casual inspection on Barra, when I decided that they were an unusual species of *Deronectes*, I sent them home immediately for transmission to Prof. Balfour-Browne.

The following is the list :—

Notiophilus biguttatus Fabr.	Lochboisdale, S. Uist.
N. substriatus Wat.	,, ,,
Nebria brevicollis Fabr.	,, ,,
Pterostichus nigrita Fabr.	,, ,,
P. strenuus Panz.	,, ,,
Hydroporus pubescens Gyll.	,, ,,
H. obscurus Strm.	,, ,,
H. erythrocephalus Linn.	Barra.
Deronectes canariensis Bedel.	,,
Haliplus ruficollis Degeer.	Lochboisdale, S. Uist.
Gyrinus natator f. *striatus* Steph.	Barra.
G. minutus F.	,,

Quedius tristis Grav.	Lochboisdale, S. Uist.	
Q. cinctus Payk.	,,	,,
Staphylinus aeneocephalus Degeer.	,,	,,
Micrambe vini Panz.	,,	,,

Of *Deronectes canariensis* only two specimens, one male and one female, were taken, and these came from a small loch on the roadside between Castle Bay and Loch Obe. Continued attempts to secure more failed and, in fact, a meagre total of less than twenty beetles represented the reward of my visit to Barra.

This species was first described by Aubé (Spec. Col. VI, page 516) in 1838 as *Hydroporus tesselatus*, and this name was used by Wollaston in 1864 (Catalogue of the Coleopterous Insects of the Canaries). However, in 1819, Drapiez (Ann. Sc. Phys. Brux., Vol. II, page 43) had already used this name for a totally different insect with the consequence that Bedel (1881), on recognising the fact, changed the name in a footnote on page 265 of his Faune des Coléoptères du Bassin de la Seine, Tome I, to *Hydroporus canariensis*, although Sharp used *Deronectes tesselatus* in the following year.

The following is a translation of Aubé's original description :—

> 'Elongate-oval, somewhat depressed, black; head on the vertex and in front reddish-ferruginous. Thorax roundish at the sides; elytra with seven lines more or less interrupted, tending to coalesce into irregular blotches towards the margins, confusedly marked with ferruginous, narrowing to a rounded apex. Length 6 mm., breadth 3mm.

This description Régimbart (Dytiscidae et Gyrinidae d'Afrique, etc., Mém. Soc. Ent. Belgique, Vol. IV) supplemented in 1895.

The two Barra specimens agree substantially with Aubé's description, except in size, for neither exceed 5 mm. in length. This fact had been noted by Prof. Balfour-Browne, prior to my access to the original description, when he compared them with authentic specimens captured by himself in Grand Canary.

The detection of this species in Barra, interesting as it is in itself, seems of great zoogeographical importance, for it would seem to be an additional Lusitanian form, adding to the probability of its having, like other Lusitanian and American forms in the Hebrides, survived the glacial period on lands, possibly now submerged, not far from where it now occurs. A discussion of the zoogeographical problem offered by this species, and novelties belonging to other groups recently discovered in the Hebrides, will form the subject of a further paper later.

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SYNONYMICAL AND OTHER NOTES ON THE DRYOPIDAE (COLEOPTERA).

BY HOWARD E. HINTON, B.SC., F.R.E.S.
(Zoological Laboratory, Cambridge).

It seems best at this time to make known numerous changes in the nomenclature which have accumulated in my notes concerning the Dryopidae, chiefly as a result of a week spent studying the Grouvelle collection in the National Museum of Natural History in Paris. For the opportunity of studying this collection of Dryopidae, the largest in the world from the point of view of the number of species represented, my best thanks are due to Dr. R. Jeannel. I would also express my appreciation to Dr. L. Berland and M. Colas for their numerous favours, which made my stay more profitable than it would otherwise have been.

DRYOPINAE.

Helichus Er.

1847. *Helichus* Er., Naturg. Ins. Deutschl. III, p. 510.
1847. *Parygrus* Er., Naturg. Ins. Deutschl. III, p. 510.
1888. *Pachyparnus* Fairm., Ann. Soc. Ent. France (6), VIII, p. 338.

I have examined types of the three Brazilian species placed in this genus and find that they all should be referred to the genus *Helichus* Er. The generic name *Parygrus* Er. should never have remained in our catalogues until this late date, for it was stillborn, that is, at the time of its erection there were no described species in the genus; not until 1896 was a species described as a *Parygrus*.

I am relegating the genus *Pachyparnus* Fairm. to synonymy with *Helichus*. I have examined specimens of the genotype, *P. tonkinus* Fairm. (1888, Ann. Soc. Ent. France (6), VIII, p. 338), as well as of *hardwicki* MacLeay and *indicus* Waterh. and can find no generic difference between these species and typical species of the genus *Helichus*.

ELMINAE.

Cylloepus confusus, nom. nov.

1888. *Elmis concolor* Grouv., Ann. Soc. Ent. Fr. (6), VIII, p. 401, t. 7, f. 11.
1910. *Elmis sharpi* Zaitzev, Col. Cat. Pars 17, p. 28.

In 1910 Zaitzev sunk the name *concolor* Grouv. as a homonym of *Elmis concolor* Lec. (1881) and renamed Grouvelle's species, *Elmis sharpi* Zaitzev. I have recently examined the type of Grouvelle's species, which correctly belongs to the genus *Cylloepus* and not *Elmis*. Unfortunately, the name *sharpi* is already preoccupied by *Cylloepus sharpi* Grouv. (1888), and since the name *concolor* cannot be restored, having once been rejected as a homonym (Article 36 of the International Code), I hereby rename the species *Cylloepus confusus* Hinton.

Cylloepus granosus (Grouv.).

1888. *Elmis granosa* Grouv., Ann. Soc. Ent. Fr. (6), VIII, p. 403, t. 8, f. 2.

The type of this species has been examined by me, and I find that it possesses all the generic characters of the group of *C. ferruginea* (Horn) (1870) of the genus *Cylloepus*.

Cylloepus grouvellei, nom. nov.

1896. *Cylloepus granosus* Grouv., Not Leyd. Mus., XVIII, p. 44.

I propose the new name *C. grouvellei* Hinton for the species *C. granosus* Grouv. (1896), which is a homonym of *C. granosus* (Grouv.) (*Elmis*).

Cylloepus flavipes (Grouv.).

1888. *Elmis flavipes* Grouv., Ann. Soc. Ent. Fr. (6), VIII, p. 404, t. 8, f. 3.

I have examined the type of this species and find that it should be referred to the genus *Cylloepus* and to the group of small species allied to *C. ferruginea* (Horn).

Cylloepus gounellei (Grouv.).

1888. *Elmis gounellei* Grouv., Ann. Soc. Ent. Fr. (6), VIII, p. 400, t. 7, f. 9.

I have seen two specimens of this species, presumably from the type series, and I find that it should be placed in the genus *Cylloepus* with the group of *C. ferruginea* (Horn).

Cylloepus subsulcatus (Grouv.).

1888. *Elmis subsulcata* Grouv., Ann. Soc. Ent. Fr. (6), VIII, p. 403, t. 8, f. 1.

A specimen determined as this species (type?) in the Grouvelle collection has been examined by me, and I find that the species belongs to the genus *Cylloepus* and the group of *C. ferruginea* (Horn).

Cylloepus sulcatus (Grouv.).

1888. *Elmis sulcata* Grouv., Ann. Soc. Ent. Fr. (6), VIII, p. 402, t. 7, f. 12.

This belongs to the genus *Cylloepus* and the group of *C. ferru-*

ginea (Horn). I have examined two specimens of the type series in the Grouvelle collection.

Elsianus germaini (Grouv.).

1896. *Cylloepus germaini* Grouv., Not. Leyd. Mus., XVIII, p. 43.

I have been able to examine the type of this species and find that it should be placed in the genus *Elsianus* Sharp and not in *Cylloepus*, as it has the characteristic stria interposed between the first and second stria of each elytron at base.

Elmis prothoracica, nom. nov.

1918. *Elmis chiloensis* Champ., Ent. Mo. Mag., LIV, p. 48.

I hereby sink the name *E. chiloensis* Champ. as a homonym of *Elmis chilensis* Germain (1854), and for the species described by Champion I propose the name *E. prothoracica* Hinton in accordance with Article 35, Section C, of the International Code.

Limnius Er.

1847. *Limnius* Er., Naturg. Ins. Deutschl., III, p. 522.

This genus is represented in North America by one species, *L. latiusculus* (Lec.)* (1866), which was placed by the author in *Elmis*, by Horn in *Elmis*, by Schaeffer in *Heterelmis*, and by Zaitzev doubtfully referred to *Limnius*. I have carefully examined this species (*cf.* text-figs. 1 and 2), and I find that it possesses all the generic characters common to the palaearctic species of *Limnius*.

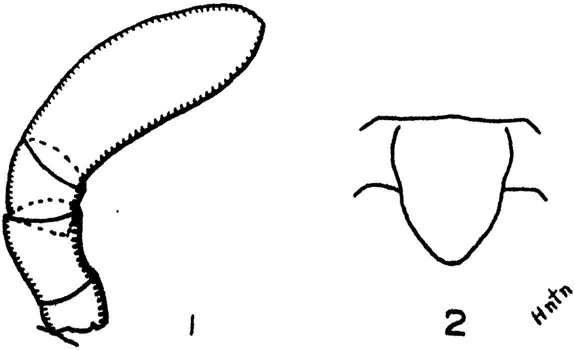

Fig. 1.—Maxillary palpus of *Limnius latiusculus* (Lec.).
,, 2.—Prosternal process of the same.

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* In a letter to me (14.xi.1934) Mr. Paul N. Musgrave says that *L. nitidulus* (Lec.) is the male of *latiusculus* (Lec.).

Riolus Muls.

1872. *Riolus* Muls. et Rey, Hist. Nat. Col. Fr. Uncifères, p. 14, 29.
1900. *Normandia* Pic, Bull. Soc. Ent. Fr., LX, p. 267.

The genus *Normandia* Pic was erected for *Riolus villosocostata* (Reiche) (1879), which had been described originally in the genus *Limnius* and had been removed by Grouvelle to *Riolus* in 1889. Pic separates his new genus from the well-known *Riolus* Muls. as follows:

'4. Prothorax relativement court et plus ou moins large, très peu ou non sensiblement plus étroit à sa base que les élytres; pas de ligne pileuse longitudinale sur le milieu de son disque .... *Riolus* Muls. Rey.
4'. Prothorax (à côtés presque droits) relativement long et peu large, sensiblement plus étroit à sa base que les élytres; une ligne pileuse longitudinale nette (parfois élevée) sur le milieu de son disque.
.... ***Normandia***, n.g.'

Before me is a specimen of *R. villosocostatus* sent through the kindness of M. Théry. The sides of the prothorax are as arcuate or more so than, for example, *R. cupreus* Müll.; it is true that the prothorax is slightly proportionally narrower than that of *cupreus*, but since there is a great deal of variation in the few species of *Riolus* before me, it seems not unlikely that this slight difference is bridged by other known species — in any case this slight difference in the proportion of the prothorax can hardly be considered as generic; the difference between the breadth of the base of the prothorax and that of the base of the elytra is scarcely greater than that of *cupreus*; and the pubescent median longitudinal line (Pic's most important differentiating character between the two genera) on the disk is rather indistinct and is obviously due only to a slight arrangement of the pubescence there.

The above brief consideration of the characters used by Pic to separate his 'new' genus from *Riolus* will enable those who are not familiar with this systematist to understand why, in general, his ephemeral effusions inspire little more than polemic.

Narpus Casey.

1893. *Narpus* Casey, Ann. New York Acad., VII, p. 582.

Narpus Casey has remained until now in our catalogues in the subfamily Dryopinae. In future it should be placed in the Elminae near the genus *Simsonia* C. & Z. This genus is represented at present in North America by three species, *N concolor* (Lec.) (*Elmis*) (1881), *N. angustatus* Casey (1893), and *N. arizonica* (Brown) (*Elmis*) (1930), *N. solutus* (Brown) (*Elmis*) (1933) having been recently relegated to synonymy with *N. concolor* (Lec.) by Fall (1934). A rediscription of the genus *Narpus* Casey is as follows:—

Elongate, obovate or subparallel, moderately convex. Dorsal surface only moderately sparsely pubescent; ventral surface with the sides of the sterna and abdominal segments very densely and finely tomentose. *Head* partially rectractile; eyes broadly separated on front of head; antennae eleven-segmented, narrowly linear, broadly separated at their bases; mandibles with three short, blunt, apical teeth, prostheca well developed and somewhat resembling the lacinia of the maxilla but much more slender: maxillary palpi three-segmented. *Pronotum* without sublateral carinae; without a median longitudinal impression and without any transverse impressions. *Elytra* punctate striate; intervals nearly flat, none carinate. *Prosternal process* moderately long, moderately broad between coxae and broadly rounded at apex. Metasternum with a deep, median longitudinal impression. All tibiae with a fringe of tomentum on their inner apices. Female genitalia of the usual stylet-bearing type common to the Elminae.

Genotype: *Narpus angustatus* Casey (1893).

This genus closely resembles *Simsonia* C. & Z., from which it may be separated by the three-segmented instead of four-segmented maxillary palpi. From *Elmis* Latr.—the only other genus in North America possessing three-segmented maxillary palpi—it may be separated by the absence of carinate lines on the prothorax.

Cambridge.
February 5th, 1936

A REVISION OF THE BRITISH SPECIES OF *HOPLOCAMPA* HARTIG. (HYMENOPTERA SYMPHYTA).

BY HERBERT W. MILES, M.SC., PH.D.

Until 1933 seven species of *Hoplocampa* were known to occur in Britain: *H. testudinea* Kl., the apple sawfly; *H. flava* L., the plum sawfly; *H. chrysorrhoea* Kl., which occurs in the blossoms of *Prunus* and *Crataegus*; *H. rutilicornis* Kl., which appears to be associated with *Prunus*; *H. pectoralis* C. G. Thoms. and *H. crataegi* Kl., which feed in the fruits of hawthorn; and *H. alpina* Zett., which feeds in the berries of mountain-ash. In 1933 Benson (1) added another species to the list, *H. ariae* Benson, which is associated with the berries of the white-beam tree, *Pyrus Aria*; and this year (1935) *H. brevis* Kl. has been found infesting pear fruits near Cambridge by Dr. I. Thomas and Mr. L. F. Clift.

Most of the species appear to be widely distributed and fairly common. *H. flava* and *H. testudinea* have been recorded from most of the important fruit-growing areas in England, and the injury they cause has brought them to the notice of economic entomologists. The life-histories of the two species have been studied (2) (3) (4).

Little is known of the hawthorn-infesting species, *H. crataegi* and *H. pectoralis*. Adults occur in May and June amongst the blossoms of *Crataegus* and *Prunus*, and Mr. Benson informs me that he has taken a single specimen of *H. crataegi* at apple blossom. In the north-west of England *H. pectoralis* and *H. crataegi* are commonly found at the blossom of *Prunus Padus*, and males and females of both species have been taken occasionally in the blossom of *Pyrus Aria*, while a few males of *H. crataegi* have been found at damson blossom. The adults seem to have a long flight period, and my specimens collected in Lancashire and Cheshire have been taken from 13th May to 1st July. Although adults are taken at the blossoms of other plants, *H. crataegi* and *H. pectoralis* have been generally associated with *Crataegus*. Eggs and larvae (figs. 1, 2, 3) typical of *Hoplocampa* spp. occur in the blossom and fruit of hawthorn during May and June, and the feeding habits of the larvae resemble those of the fruit-infesting species that have been studied.

H. chrysorrhoea occurs at the blossoms of *Prunus spinosa* and has been recorded recently from Gloucestershire, Buckinghamshire, Cambridgeshire, Cheshire, Lancashire, Westmorland and Dumfrieshire in Scotland, Kerry and other parts of Ireland. Though the insects have always been taken singly, the records seem to indicate some association between *H. chrysorrhoea* and *Prunus* (11). In the spring of 1935, however, Dr. A. M. Massee sent me a number of females that he had taken on hawthorn near East Malling, Kent, and informed me that there was no *Prunus* in the immediate vicinity and that the insects were definitely 'interested' in the hawthorn. Though this suggests that *H. chrysorrhoea* may breed in hawthorn, the insects might only have been chance visitors. It has been suggested (5) that gooseberry (*Ribes Grossularia*) is the host-plant of *H. chrysorrhoea*, but I have so far failed to find adults or any larvae of the *Hoplocampa* type on this plant.

H. rutilicornis has also been associated with *Prunus* by Hartig (8). Perkins (6) records the species from Devonshire and Cameron from Scotland (7). I have taken one male on *Prunus domestica* in Cheshire and another on the same host in Westmorland, and I found a female of *H. rutilicornis* in a consignment of *H. minuta* Christ. received from Herr Zirngiebl from Leistadt (Pfalz, Germany). These records support the observations of Perkins and Cameron and further associate the species with *Prunus*.

H. alpina appears to confine its attacks to the blossom of mountain-ash, *Pyrus Aucuparia*. This species is exceedingly pale in both body and wing coloration and about the same size as *H. flava*. My most recent specimens include a female from Cheshire (25.v.33) and another from Cambridge collected by Mr. F. R. Petherbridge (1.v.33).

H. ariae has not been generally observed, but its occurrence in such widely separated localities as Surrey and Cheshire indicates a fairly wide distribution. *H. ariae* is about the size of *H. testudinea,* pale, but with the body coloration darker than that of *H. alpina.*

The most recent addition to the British list of *Hoplocampa* spp. is *H. brevis* Kl., the pear fruit sawfly. This species occurs on the Continent, and Brischke and Zaddach (9) recorded rearing the insects from pear fruits as long ago as 1883. In England the insects have been recorded from two adjoining gardens at Cambridge, and the specimens I have examined are females. The circumstances under which the insects occurred at Cambridge suggest that the species is not a recent introduction, but that it has been established in the locality for some time, and further observations may reveal its presence in other parts of the country.

This brief survey shows that only two of the British species of *Hoplocampa* have been studied in detail, and that little is known of the biology and distribution of the other species. The association of the genus with *Pyrus, Prunus* and *Crataegus* indicates a high degree of specialisation, while the egg-laying habits of the adults and the feeding habits of the larvae suggest that the genus as a whole is univoltine, and that the numbers and distribution of individuals and species are susceptible to influence by weather conditions that affect the set of fruit. The following key to the British species has been adapted from Enslin (5) and Morice (10) after, in most instances, a study of an extensive series of recently obtained specimens.

KEY TO IDENTIFICATION OF BRITISH SPECIES OF *HOPLOCAMPA*.

1. Abdomen with underside yellow or pale; head with clypeus deeply emarginate 2
— Abdomen with underside entirely or largely black; head with clypeus shallowly emarginate 6
2. Stigma parti-coloured, black or brownish at base, yellow or paler at apex 3
— *Stigma unicolorous white, yellow or brown* 6
3. *Dorsum of abdomen shining black except that the 9th segment may be* yellowish or reddish 4
— Dorsum of abdomen mainly brownish or yellowish, with at most the base black 5
4. *Mesonotum almost entirely dark brown or black and shining, and with shallow inconspicuous puncturation.* Head with large black area

covering the vertex, ocelli and major part of the pentagonal area. Wings with vein dark brown except for apex of stigma. ♀ length 6—7 mm. .... *H. testudinea* Kl.

— Mesonotum with conspicuous light brown areas on the median and lateral lobes and on the scutellum; scutellum with a dark brown or black median vitta. Puncturation of mesonotum coarse, regular and deep. Head entirely light brown except for the narrow dark brown or black margins of the vertex and ocelli. Wings with veins light or dark brown and apex of stigma conspicuously pale. ♀ length 5—5.5 mm. .... *H. brevis* Kl.

5. Forewings with basal two-thirds clouded with yellow and apices clear; a dense band of yellow crossing wings obliquely below the stigma. Costa, sub-costa and base of stigma yellow or light brown; stigma only slightly darker at base than at apex. Head, antennae and mesonotum brown in females; some dark brown or black colour often present on vertex and mesonotum of males. Wings with veins yellow or light brown. ♀ length 5.5mm. .... *H. flava* L.

— Forewings clear; costa, sub-costa and base of stigma dark brown. In both sexes mesonotum black and shining. Antennae largely black in females, and antennal segments 3—6 with some black on upper surface in males. ♀ length 4—5 mm. .... *H. pectoralis* C. G. Thoms.

6. Head, thorax and abdomen above largely yellow or reddish-yellow 7

— Head, thorax and abdomen above black and shining 9

7. Wings whitish or cream-coloured throughout; stigma, costa and sub-costa pale or colourless. Head and mesothorax whitish-yellow, pale brownish vittae present on the mesonotal lobes. Head with clypeus widely emarginate; antennae with segments 3—9 inclusive brownish above and pale beneath; legs whitish-yellow with tarsi brownish. ♀ length 5—5.5mm. .... *H. alpina* Zett.

— Wings yellow 8

8. Sunken parts of mesonotum entirely and metanotum largely yellowish or fuscous. Wings with costa, sub-costa and stigma yellow. Head yellow. Clypeus deeply and roundly excised. Lateral lobes of mesonotum with indications of dark vittae. ♀ length 5—6.5 mm., *H. ariae* Benson.

— Sunken parts of mesonotum black and shining and usually some black present on abdominal terga 1 and 2. Scutellum usually immaculate yellowish; mesothorax usually with dark area anteriorly on the median lobe and brownish or dark vittae sometimes present on the lateral lobes. Scutellum of metanotum yellow. Head reddish-yellow; clypeus widely emarginate. Antennae of female brown except that segments 1 and 2 may be yellowish; antennae of male yellow. Wings with costa yellow, sub-costa yellowish-brown or brown and stigma pale yellow. ♀ length 5—5.5 mm. .... *H. crataegi* Kl.

9. Abdomen yellowish beneath; wings with costa, sub-costa and stigma brown or dark brown. Head with clypeus pale, broadly and evenly emarginate and strongly pubescent. Legs yellow with tips of tibiae and tarsi brownish. ♀ length 4—4.5 mm. .... *H. chrysorrhoea* Kl.

— Abdomen black beneath save that the extreme tip may be pale or yellowish. Wings with costa, sub-costa and stigma greyish or yellowish. Head with clypeus very narrow and shallowly emarginate; clypeus and labrum yellow. Antennae and legs largely yellow in both sexes. ♀ length 3.5—4 mm. .... *H. rutilicornis* Kl.

I am indebted to Dr. Thomas and Mr. Clift for specimens of *H. brevis*, and to Mr. Benson for helping me generally, and specially for confirming the identity of specimens of *H. ariae* and *H. alpina* taken in Cheshire in 1933.

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EXPLANATION OF PLATE I.

FIG. 1.—Egg site of *Hoplocampa crataegi* Kl. below calyx of hawthorn flower. × 4.

FIG. 2.—Larva of *Hoplocampa* sp. tunnelling into fruit of hawthorn. × 4.

FIG. 3.—Fruit of Hawthorn showing exit hole of fully fed *Hoplocampa* larva. × 3.

FIG. 4.—*Hoplocampa brevis* Kl., adult female, showing typical wing-venation. × 3 approx.

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November 23rd, 1935.

COLLEMBOLA FROM WEST SPITSBERGEN.

BY JAMES M. BROWN, B.SC., F.L.S., F.R.E.S.

Through the kindness of Mr. Charles Elton I have had the opportunity of examining a small collection of Collembola brought back by the members of the Oxford University Arctic Expedition, 1933. Seven tubes of preserved material, collected on West Spitsbergen, were submitted. Five species of Collembola were represented, none of which were, however, new to the district, all having been reported by the earlier expeditions (Wahlgren, 1899), and also by the more recent Oxford University Expedition of 1921 (Carpenter and Phillips, 1922).

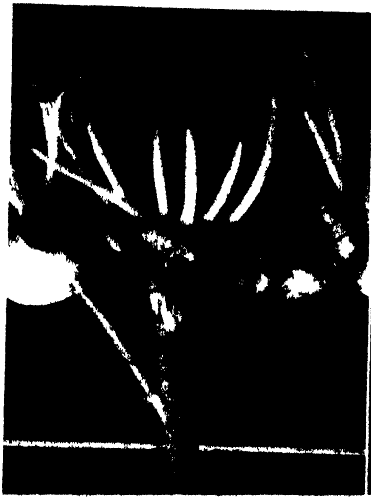

Fig. 1

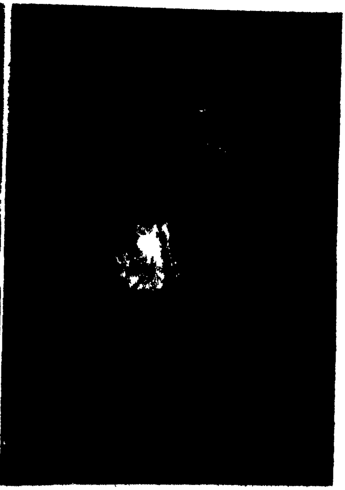

Fig. 2

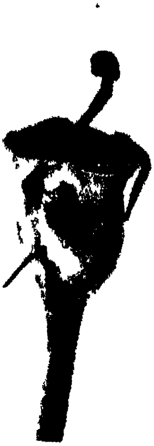

Fig. 3

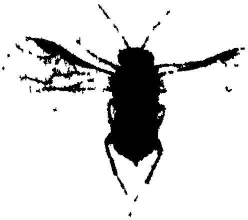

Fig. 4

BRITISH SPECIES OF HOPLOCAMPA.

[*Photos by H. W. Miles.*]

The Collembola known from West Spitsbergen number seventeen species; those obtained by the Oxford University 1921 Expedition number eight, and by the present Oxford University Expedition five species. Perhaps the most notable omission from the present collection is *Archisotoma besselsi* (Pack.), one of the most characteristic and commonly occurring Spitsbergen species.

LIST OF SPECIES COLLECTED.

Order COLLEMBOLA Lubb.

Suborder ARTHROPLEONA Börn.

Family **Hypogastruridae** Börn.

1. *Hypogastrura viatica* (Tullb.).

1872. *Achorutes viaticus* Tullberg, Kongl. Sv. Vet.-Akad. Förhandl., p. 50.
1912. *Hypogastrura viatica* Linnaniemi, Acta Soc. Sc. Fenn., p. 19.
1922. *Achorutes viaticus* Carpenter and Phillips, Proc. Roy. Irish Acad., p. 12.

Locality.—Two specimens, pond near base hut, Petunia Bay, 8.viii.33 (*A. R. Glen*).

This is a widely distributed species, especially in the Northern Hemisphere, but occurring also in the sub-Antarctic Regions. It is surprising that only two specimens were obtained, as the species frequently occurs in enormous numbers. Normally a land form, it sometimes frequents the surface of water-pools.

Family **Onychiuridae** Börn.

2. *Onychiurus armatus* (Tullb.) var. *arcticus* (Tullb.).

1876. *Lipura arctica* Tullberg, Öfv. K. Svensk. Akad. Förhandl., p. 39.
1904. *Onychiurus armatus* var. *arcticus* Ågren, Arkiv. f. Zool., p. 12.
1922. *Onychiurus armatus* var. *arcticus* Carpenter and Phillips, Proc. Roy. Irish Acad., p. 13.

Localities.—Thirty-two specimens, under stones on a raised beach, Klaas Billen Bay, 9.viii.33 (*J. M. McC. Fisher*).

Eight specimens, under seaweed, on shore of Petunia Bay, Klaas Billen Bay, 5.ix.33 (*O. Gatty*).

The form *arcticus*, which is specially associated with the Arctic Regions, differs from the type in size and in the length of the bristle terminating the empodial appendage, and, as was pointed out by Ågren, does not appear to differ specifically from *O. armatus* (Tullb.).

Family **Isotomidae** Börn.

3. *Folsomia quadrioculata* (Tullb.).

1871. *Isotoma quadrioculata* Tullberg, Öfv. Kongl. Vet.-Akad. Förhandl., p. 152.

1912. *Folsomia quadrioculata* Linnaniemi, Acta Soc. Fenn., p. 111.

1922. *Folsomia quadrioculata* Carpenter and Phillips, Proc. Roy. Irish Acad., p. 14.

Locality.—Two specimens, shore of Petunia Bay, Klaas Billen Bay, 5.ix.33 (*O. Gatty*).

This is another widely distributed species in the Northern Hemisphere. It has been recorded for Spitsbergen several times previously.

4. *Isotoma viridis* (Bourl.).

1839. *Isotoma viridis* Bourlet, Mém. Soc. des Sc. de l'Agricult. de Lille, p. 401.

1922. *Isotoma viridis* Carpenter and Phillips, Proc. Roy. Irish Acad., p. 15.

Localities.—Six specimens, on rocks, Treurenberg Bay, 13.vii.33 (*O. Gatty*).

Two specimens, under stones, Bruce City, Klaas Billen Bay, 18.vii.33 (*J. M. McC. Fisher*).

One specimen, sea-shore, Petunia Bay, 5.ix.33 (*O. Gatty*).

Seven specimens, under stones on a raised beach, Bruce City, Klaas Billen Bay, 9.viii.33 (*J. M. McC. Fisher*).

This is one of the commonest Collembola of the Northern Hemisphere. As was the case with the earlier Expedition, this species occurred in more localities than any other, but in the present instance was not obtained in such large numbers as was *O. armatus* var. *arcticus*. All the specimens belonged to f. *principalis*, and were evidently the same as those recorded previously by Carpenter and Phillips.

5. *Agrenia bidenticulata* (Tullb.).

1876. *Isotoma bidenticulata* Tullberg, Öfv. K. Svensk. Akad. Förhandl., p. 35.

1912. *Agrenia bidenticulata* Linnaniemi, Acta Soc. Sc. Fenn., p. 173.

1922. *Agrenia bidenticulata* Carpenter and Phillips, Proc. Roy. Irish Acad., p. 15.

Locality.—One specimen, pond near base hut, Petunia Bay, 8.viii.33 (*A. R. Glen*).

A species commonly found about the margins of upland streams, and widely distributed in Northern Europe, including Britain. As it usually occurs in large numbers when present at all, it is surprising that only one specimen should have been obtained.

LITERATURE.

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176 Carter Knowle Road,
Sheffield 7.
January 24th, 1936.

A NEW SPECIES OF PROTURA FROM AUSTRALIA.

BY H. WOMERSLEY, A.L.S., F.R.E.S.
Entomologist, South Australian Museum.

The following new species of Protura is the seventh to be described from Australia. It was first taken by Mr. D. C. Swan, of the Waite Research Institute, South Australia, on the banks of the River Onkaparinga, near Noarlunga, South Australia, on April 25th, 1932, in some numbers. Later, the writer, while spending a week-end in the Porongorups, Western Australia, with Dr. R. J. Tillyard, found two adult and five immature specimens under stones on the banks of the stream in the Bolganup Ravine on September 30th — October 1st, 1932.

The species is very distinct from all the four other species of *Acerentulus* known from Australia in the ratio (TR) of the length of the front tarsus to that of the claw, and, in particular, in the chaetotaxy of the eighth sternite.

Acerentulus sexspinatus sp. n.

Description: Length (extended) 1725 μ. Head 160 μ long by 115 μ wide, widest at one-fourth from base, well chitinised; pseudocelli at about one-third from apex, elongate, 10 μ long and 15 μ wide, divided; front cephalic setae 22 μ long, basal 12 μ.

Thoracic segments well chitinised, apodemes only visible on segment III. Front legs 380 μ long, tarsus 132 μ, claw short, evenly curved, and 22 μ long, TR=6.0, subapical setae 38 μ. Middle legs 200 μ, claw 22 μ, tarsus 55 μ. Hind legs 240 μ, claw 24 μ, tarsus 50 μ.

Abdomen fairly well chitinised, tapering slightly posteriorly, apodemes present and well chitinised, curved strongly on tergites I—VII, straight on VIII, small pectines present on VIII. First pair of abdominal appendages 50 μ long, second and third pairs 22 μ.

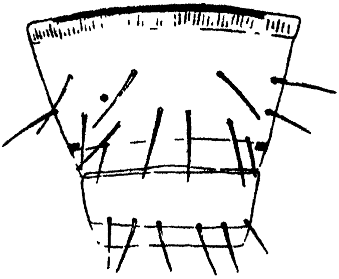

Fig. 1

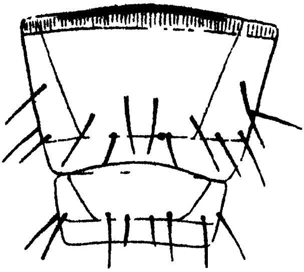

Fig. 2

Chaetotaxy: sternite VIII with two posterior setae and a sub-posterior row of four setae, IX with four posterior setae, the median pair less than half the length of the lateral ones; tergite VIII—IX as in figure 2. Setae on tergites other than these much finer.

Adelaide, South Australia.
January, 1936.

Hydroporus ferrugineus Steph.; a new and an old record.—In 1933 my friend Mr. P. Harwood kindly gave me a plan of a locality in Hampshire where he had taken *Hydroporus marginatus* Dufts., *Agabus biguttatus* Ol., *A. uliginosus* L. etc. As I had not a full series of the *Hydroporus*, the late Miss Kirk and I, during a visit to the New Forest in June, 1933, determined to try for it. The nearest village, I believe, is called Cranborne, but no one would be able to find the place without the aid of a plan. On June 11th, 1933, we took a car, and after a fairly long drive we eventually reached the spot—a sort of lake with a stream running through it and, as Harwood told me, with springs bubbling up in the bottom of the lake. When we were there, however, the stream was bone-dry and the lake was reduced to a fair-sized pond. I have heard that later on the whole place was absolutely dried up. As nothing could be done on the outskirts of the water we removed our shoes and stockings and waded in as far as possible towards the centre, where the water was quite deep. After considerable fishing we captured a nice series of *H. marginatus* and the two *Agabi*; but we also fished up another interesting species of *Hydroporus*—*H. ferrugineus* Steph. The springs above mentioned would account for the presence of this insect, as it is generally recorded as a running water species, especially in mountainous and high localities. Fowler (Col. British Islands, I, p. 187) gives Collingbourne Wood, near Marlborough; Kimpton, Andover; Whalley, near Preston; Snowdon; Scotland; local; and in the Supplementary Volume we give Hastings (Bennett), Plymouth (Keys), Seaton (Champion), Horning (Edwards), Hart, Durham (Gardner), Cumberland (Britten). *H. ferrugineus* is undoubtedly attracted to springs and has been recorded as having been found in bath-water, etc. From 1894 to 1897 I used to take it in a little spring a short distance up the cliff at Old Hastings, a spot shown to me by the late W. H. Bennett. In the excellent manuscript catalogue of the Coleoptera of Cambridgeshire by the late Rev. Leonard Jenyns (presented to the Cambridge University Museum in April, 1868) he records it as having been taken 'in pump water, Swaffham Bulbeck.'—HORACE DONISTHORPE, Department of Entomology, British Museum (Natural History): *February 17th*, 1936.

Societies.

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at 332 Great West Road, Heston, Middx., at 7.30 p.m. on the 11th December, 1935, Mr. Horace Donisthorpe in the Chair.

Members present in addition to the Chairman: Mr. Jas. E. Collin, Mr. R. W. Lloyd, Visitors present: Rev. E. B. Ashby, Mr. R. B. Benson, Mr. de A. Donisthorpe, Dr. Karl Jordan, Mr. J. F. Perkins, Mr. W. Rait-Smith, Capt. N. D. Riley.

A very pleasant and entertaining evening was spent.—H. WILLOUGHBY ELLIS, *Hon. Secretary.*

The Verrall Supper meeting, under the auspices of the Entomological Club, was held at the Holborn Restaurant on January 14th, 1936.

The meeting was called for 6.30 p.m., when the usual conversazione was held in the reception room, and dinner was served at 8 o'clock. Mr. H. Donisthorpe in the chair.

One hundred and seventy-four acceptances of the invitations issued were received and 172 sat down for dinner. This was four less than last year and there were some noticeable absentees. Mr. G. T. Bethune-Baker, who has always taken so much interest in the gathering, was unable to come. Mr. F. W. Frohawk, who has not missed an attendance for 45 years, was unfortunately still too ill to be present, and Sir E. B. Poulton, who is the sole survivor of those who were invited to the first supper given by Mr. Verrall in 1887, was absent abroad.

After the toast of the King and the silent toast of Mr. Verrall, the founder, the guests freely intermingled at the tables and continued to spend a most enjoyable evening.

The gathering continues to be very successful and it is understood that a considerable number of Entomologists are anxious to join the gathering and become subscribers, and it is necessary here to state that no invitations can be issued without first applying to Mr. J. E. Collin, of Raylands, Newmarket, the Verrall Supper Member of the Entomological Club, who is responsible for the whole of the organisation.

Appreciation was expressed on all hands of the excellent arrangements which were very complete, and Mr. Collin is to be congratulated on the great success of the gathering which every year is due to his forethought and organisation.—H. WILLOUGHBY ELLIS, *Hon. Sec.*

THE ROYAL ENTOMOLOGICAL SOCIETY OF LONDON.—ANNUAL MEETING. *Wednesday, 15th January,* 1936.—Dr. S. A. NEAVE, O.B.E., President, in the Chair.

Mr. A. W. McKenny-Hughes, Secretary, read the names of Fellows nominated as Officers and Council for the ensuing year, and announced that they had been duly elected in accordance with the Bye-Laws.

The Secretary read the Report of the Council, which was adopted on the motion of Mr. H. Willoughby Ellis, seconded by Mr. J. E. Collin.

The Treasurer, Mr. Francis Hemming, C.B.E., read his report, and this, with the Accounts for the year, was adopted on the motion of Dr. C. B. Williams, seconded by Mr. H. M. Edelsten.

The President read his Address, after which a vote of thanks to him, coupled with the request that the Address might be published in the *Proceedings*, was moved by Dr. K. Jordan, and carried unanimously.

A vote of thanks to the Officers for their services was passed on the motion of Professor G. D. Hale Carpenter, seconded by Mr. R. W. Lloyd, and carried unanimously. Mr. A. W. McKenny-Hughes and Mr. Francis Hemming briefly replied.

Mr. Francis Hemming, on behalf of Fellows and friends of the Society, offered a portrait of Dr. Neave and a book containing the signatures of subscribers to be presented to Dr. Neave in recognition of his long service as an Officer of the Society. Mr. R. W. Lloyd, as one of the Senior Fellows, supported Mr. Hemming, and Dr. Neave expressed his pleasure in accepting this indication of the Society's good wishes.—A. W. MCKENNY-HUGHES, *Hon. Sec.*

SYSTEMATIC NOTES UPON BRITISH AQUATIC COLEOPTERA.

BY FRANK BALFOUR-BROWNE, M.A. (OXON. ET CANTAB.), F.R.S.E., F.Z.S., F.R.E.S., F.R.M.S.

(formerly Professor of Entomology at the Imperial College of Science, London).

PART XI. HALIPLIDAE.

(*PELTODYTES, HALIPLUS* AND *BRYCHIUS*.)

For a long time, one of the characters upon which authors separated the Haliplidae from the rest of the Hydradephaga was the ten-segmented antennae, the other groups having eleven segments, and it was not until 1922 that von Emden showed that the Haliplid antenna is eleven-segmented, as in all the Adephaga, the difference in appearance being due to the length of the exposed part of the basal segment, which is very short in the Haliplidae and very long elsewhere. Zimmermann (1924), for some unaccountable reason, treated the basal bulb of this segment as independent and described the antenna as of twelve parts in Haliplids and of eleven in the rest of the Adephaga.

Three genera of the family are represented in the British Islands and appear in Fowler (1887) as *Cnemidotus, Haliplus* and *Brychius*. There is some confusion with regard to the first two names. In 1802, Latreille created the genus *Haliplus*, of which he mentions two species, *Dytiscus obliquus* Fab. and *D. impressus* Fab., but in the same year Illiger created the genus *Cnemidotus* for *D. obliquus*, *D. fulvus*, *D. impressus*, *D. elevatus* and an unnamed Portuguese species. It is clear, therefore, that both these authors had given names to the same group of species, so that one of the names is a synonym of the other. I have not enquired into the question as to whether Latreille or Illiger appeared first in print, as *Haliplus* is universally recognised as the name for the large genus scattered over the northern hemisphere, and it would be most unwise to change the name. We can therefore treat *Cnemidotus* as a synonym of *Haliplus*, as did Latreille himself (1806). In 1832 Erichson, with a seven-word description of what he described as '*Cnemidotus* Illiger,' placed in it the single species *caesus* Duftschmid, giving as synonyms *Haliplus caesus* Gyll. & Sturm and *Dytiscus impressus* Panz. In 1878 (p. 457), Régimbart called attention to Erichson's mistake and proposed the name *Peltodytes* for Erichson's genus, of which *Dytiscus caesus*, the only species mentioned by Erichson, is the genotype. It is to be noted that Erichson's character of his genus, the cone-shaped apical segment, longer than the penultimate, of the maxillary and labial palpi, definitely separates it from *Haliplus* and is therefore evidence that his *Cnemidotus* was not that of Illiger.

Thus, the British list should read:—

Peltodytes Régimbart (1878) = *Cnemidotus* Erichson (1832),
not Illiger (1802).
caesus Duftschmid (1805) = ? *impressus* Fabricius (1787),
Panzer (1794).

Our only species of *Peltodytes* has been known as *impressus* Fab. with the synonym *caesus* Dufts. and here our difficulties begin, since Latreille (1810) made *Dytiscus impressus* Fab. the genotype of his genus *Haliplus*. Fabricius' description of his species might refer to almost any species of Haliplid and his short definition appeared first in 1787. In 1792 he gave as a synonym '*Dytiscus impressostriatus*' Schaller, which is an error for '*impressopunctatus*.' Schaller described his species in 1783 but there is nothing to determine its identity as an Haliplid. In 1801, Fabricius gave a synonymy indicating that his *impressus* was that of Panzer (1794), of Olivier (1795), of Paykull (1798) and of Illiger (1802). Both Olivier and Panzer give figures of their species, so that we can satisfy ourselves as to the complete uselessness of the synonymy, since Olivier's figure is an *Haliplus* without thoracic striae,[1] while Panzer's figure, with the subscription '*Dytiscus impressus* Fab.,' is almost certainly *Peltodytes caesus*. Olivier gives a synonymy for this *impressus* which includes *Dytiscus ruficollis* De Geer (1774) (whose figure shows an *Haliplus* without thoracic striae[1]) and *D. laminatus* Linn. (1788), which is *laminatus* Schaller (1783), this latter being recognised by Zimmermann as identical with *cinereus* Aubé.

The *ruficollis* group has been the most difficult to clear up of all the Hydradephaga because so many authors, including recent ones, have obviously guessed at synonymies even when, by taking a little trouble, they might have obtained specimens for comparison. Numerous authors have described an Haliplid under the name *impressus*, and Zimmermann has identified some of these in spite of, what seem to me, entirely inadequate descriptions and of inaccurate and impossible synonymies. Thus Gyllenhal (1808), after a colourless description, identifies his species with *impressus* of Fabricius (1787), Panzer (1794), Thunberg (1794), Olivier (1795) and Illiger (1798), and with *laminatus* of Schaller. Var. β he describes as *impressus* of Paykull (1798) and as *flavicollis* of Marsham (1802) and var. γ as *ruficollis* De Geer (1774). Zimmermann, by what appears to be intuition, recognised *fluviatilis* of Aubé. Erichson (1839) describes an *impressus* two lines long and gives as synonymy *impressus* Fab. and *impressus* var. γ Illiger and *flavicollis* Sturm. and Aubé, and Zimmermann identifies this as *flavicollis* Sturm, which the size justifies, although it stultifies Erichson's other synonyms. Kirby (1837) named an American species *impressus* with a synonymy *impressus* Fab., Payk., Illig., Thunb., etc., and *laminatus* Schall., *flavicollis* Marsh., the length of his species being one and a half lines, and he is one of the few early authors who mentions the pronotal striae.

Therefore it seems to me that none of these *impressus* can be identified and, seeing that Müller (1776) described a *Dytiscus impressus* which is certainly not an Haliplid, the name is in any case invalid.

This creates another difficulty, since Latreille (1810) made *Dytiscus impressus* Fab. the type of his genus, and if this cannot be identified Latreille's genotype must go. In 1839 Curtis fixed *Dytiscus ferrugineus* Paykull as the genotype and, from his figure and description, there is no doubt that this is *Dytiscus fulvus* of Fabricius, which therefore should be accepted as the type of the genus.

Another difficulty in the *ruficollis* group centres round my species *nomax* and that which Sharp named '*browneanus*' and which, I pointed out at the time, I regarded only as a form of *nomax*. I have since gone into this matter again and am more than satisfied that these are two forms of one species. In Britain, *nomax* is northern and western and *browneanus* is eastern and southern, and, so far, no one has observed any mixing of the forms. Zimmermann, who did not take the trouble to obtain specimens from either Dr. Sharp or me, regarded *nomax* as a distinct species but made *browneanus* a synonym of *transversus* of Thomson, which in 1917 (1919) he suggested might be a northern race of *lineolatus* of Mannerheim. In 1924, he definitely made *transversus* a synonym of *lineolatus*.

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[1] It is curious that none of the earlier authors appear to have seen these thoracic striae. De Geer's figure of his *H. ruficollis* is without these striae and Dr G. Falkenström has very kindly examined the type of this species in the Riks Museum. Stockholm, and he tells me that there are only two 'type' one a female of what we know as *ruficollis* and the other a female of *H variegatus* Sturm.

Through the kindness of Dr. Hellén, of the University Museum of Helsingfors, Finland, I have seen four specimens of *lineolatus*, one, a ♀ although labelled ♂, bearing a label 'Spec. type No. 63 *Haliplus fluviatilis* var *lineolatus* Mannh.'[2] He also sent me a number of specimens labelled *transversus* and one labelled '*H. sibiricus* Motsch. J. Sahlb. det,' all of which are identical with *H. browneanus*. Through the kindness of Dr. Kuntzen, of the University Museum, Berlin, I was also able to examine a type specimen (♂) of *transversus* Thomson, which is a giant specimen (3.2 mm.) of *browneanus*, the usual length of which is about 2.7 mm. Dr. Kuntzen also sent me a number of specimens, ♂ and ♀, determined by Zimmermann as *lineolatus*, all of which are what we know here as *wehnckei* of Gerhardt. Zimmermann made Gerhardt's name a synonym of *transversus* which, as already stated, he later made a synonym of *lineolatus*, basing his identification of the latter upon a specimen in the Schaum Collection, now in the Bavarian State Museum at Munich, to which he refers thus: 'In the Berliner Ent. Zeitschr., 1859, p. 85, Schaum, relying upon an original specimen,[3] identified *lineolatus* Mannh. with *fluviatilis* Aubé. This insect was taken over, together with Schaum's collection, by Cl. Müller, Dresden, and later passed into the Bavarian State Collection in Munich. A personal examination of this type specimen has convinced me that this insect is not identical with *fluviatilis* but belongs to another form, very closely related to the latter, which was recognised as independent by Wehncke and was correctly referred by him to *H. lineolatus* Mannh.'

Through the kindness of Dr. Külzer, of the Bavarian State Museum, Munich, I have now seen a number of specimens of *Hali-*

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[2] I am assured by Dr. Hellén that this is definitely a Mannerheim type.

[3] Schaum's note is as follows:—'*Haliplus lineolatus* Mannh. ist einem Originalexemplare zufolge auf kleine blasse Stücke des *fluviatilis* Aubé gegründet, bei denen die schwarzen mit Punkten besetzten Linien der Flügeldecken fast gar nicht unterbrochen sind. Einen weiteren Unterschied vermag ich nicht zu ermitteln.'

plus from the State Collection. Among these is one typical ♂ *H. fluviatilis* from the v. Seidlitz collection, labelled as such but also carrying a label '*lineolatus* Heyd.' Among nineteen other specimens standing in the State Collection as *H. fluviatilis* was one labelled '*lineolatus* Mannh.' 'Sammlung Cl. Müller,' and as these two specimens, I am told, are the only two in the Collection with a *lineolatus* label, I believe that this last specimen is the one referred to by Zimmermann in the passage I have quoted. It is a ♂ *immaculatus* Gerh. from which the aedeagus has been extracted, but is easily identified by the unequal anterior tarsal claws, which are specially referred to by Zimmermann, and by the sculpture of the prosternal process.

In general shape it comes very near to *fluviatilis*, but the elytral striae are evenly marked throughout their length, instead of showing broadened patches of colour characteristic of *fluviatilis*. It resembles *wehnckei* in the anterior tarsal claws and is more like *wehnckei* than like *fluviatilis* in the prosternal process. Thus, once Zimmermann had assumed this specimen to be a type of *lineolatus* Mannh., everything he says about *lineolatus* fits in. It is curious to note that Zimmermann regarded this as a type specimen, yet later, as quoted, he says that this form was recognised as independent of *fluviatilis* by Wehncke and was correctly referred by him to *lineolatus*. If it was a type specimen, why did Wehncke have to identify it?

Haliplus is an interesting genus because, although a number of the species are easily distinguished, there is this curious cluster of species related to *ruficollis* De Geer. Until 1911, no suggestion of subgenera seems to have been made, but in that year Netolitzky placed *lineatocollis* in a subgenus '*Neohaliplus*' on characters which Zimmermann (1917 (1919)) regarded as insufficient and Des Gozis ignored.[4] In the paper referred to, Zimmermann made four species-groups in the genus: (1) confinis-group, including the British species *obliquus* and *confinis*; (2) lineaticollis-group (the spelling is his and not that of Marsham, who named the species), including one British species; (3) ruficollis-group, including eight British species; and (4) fulvus-group, including the remaining five British species. Guignot (1933) has gone farther than any other author in making four subgenera, corresponding to these four species-groups. I can see no justification whatever for such marked importance of these groups, the relationship between which is, I think, adequately expressed by Zimmermann's method.

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[4] Scholz, M. F. R. (1929) proposed the genus *Protohaliplus* for *H. lineatocollis*, apparently in ignorance of Netolitzky's paper.

In the first group, *confinis* varies in appearance from almost black to a form in which the dark markings have almost faded out. This latter form was, according to Fowler (1887), first taken by Bold near Newcastle-on-Tyne and introduced by him as *H. varius* Nicolai, now recognised as a distinct species, although at that time, following Erichson (1839), regarded as a variety of *obliquus*. How a collector of Bold's experience could mix up *obliquus* and *confinis* it is difficult to understand, but, once the mistake was made, it appears (again according to Fowler) that similar specimens were in both the Power and Sharp collections under the same name. Rye (1869) first recognised these specimens as a variety of *confinis* and Fowler gave them the name 'var. *pallens*.' Edwards (1911, p. 6) stated that the then Custodian of the Hancock Museum either showed him or sent him from the Bold collection two specimens 'bearing a blue ticket on which is written *varius* in handwriting said to be his' (Bold's) and that 'these are quite ordinary specimens of *confinis*.' From Bold's description (1868, p. 284) that his *varius* was 'of the same pale testaceous hue as *obliquus*,' it is obvious that the specimens seen by Edwards cannot have been those seen by Rye. Moreover, Edwards mentions that he was 'informed by Mr. E. A. Waterhouse that his father had a number of *H. pallens*, all of which he believes came from Bold,' and Waterhouse would not have accepted ordinary specimens of *confinis* and placed them as a variety. Unfortunately, there are no specimens now in the collections in the Hancock Museum either of a pale-coloured *confinis* or labelled '*varius*,' and I must thank the present Curator, Mr. T. Russell Goddard, and his assistant for having taken a large amount of trouble trying to find for me the required specimens. We can therefore only assume that Bold took this pale-coloured form in the neighbourhood of Newcastle-on-Tyne, although otherwise the only published records are for Loch Leven, Kinross, whence came two of the Power specimens, and for the Oxford district, Walker (1905). I visited Loch Leven in 1930 and took ten specimens of this pale form, but on several subsequent visits I have failed to find any. These Loch Leven specimens are, I think, paler than any I have taken elsewhere, but I have pale specimens from Lewis (Outer Hebrides) and one from Caithness, so that there are intermediate colourings between the normal and the extreme pale form. In 1928 Bullock named a dark form of this species 'var. *halberti*,' but, as in the pale form, so in this, there are intermediates between the extreme and the type so that, as I suggested previously (1930), these are habitat forms and should not be distinguished by names.

In 1924, E. J. Pearce described four means of distinguishing *obliquus* from *confinis*, two of which are readily seen, *i.e.* the angle made by the border of the pronotum and the elytron, which is much more noticeable in *obliquus*, and the shape of the outline of the elytron, which is distinctly more rounded in *confinis*. The aedeagi of the two species are also very different and, I may add, the left [5] parameres also, but Pearce's remaining character is connected with the metacoxal lamellae. He states that in *obliquus* these plates have large, flat, round depressions in addition to the fine punctuation, whereas in *confinis* he says these depressions are absent. As a fact, I could not make out a definite difference between the two until I examined them by transmitted light, and it appeared that *confinis* has the large distinct punctures, while in *obliquus* these punctures are obsolete.

In connection with the ruficollis-group, I should perhaps recall the fact that in an earlier paper (1915), I recorded my opinion that *H. striatus* Sharp is the same species as *H. apicalis* Thomson. I was promptly taken to task for so doing, and Sharp (1915, p. 122) declared that Thomson's description did not agree with any *Haliplus* known to him. Others have, however, taken the same view as I did, and Zimmermann (1917 (1919)), in a footnote, states that 'the original specimen of *H. apicalis* which von Seidlitz, in his "Determination-Tables," quite correctly interpreted as *striatus* Wehncke, is undoubtedly also identical with *striatus* Sharp and Edwards.'

In the fulvus-group a great deal has been made of the variations of *H. fulvus*, and at least six varieties have been named by various authors, one of these, var. *lapponum* of Thomson, having since been raised to specific rank by Guignot (2. 1928, p. 141). He has very kindly sent me specimens of his new species, but I cannot recognise the specific distinction in the aedeagus which he figures, and other differences appear to me to be merely extremes of variation present in a lesser degree in other specimens. I have, among my British specimens of *fulvus*, some which show the reduced shoulders and the darker surface, and I think that the slight inequality of the surface and slightly coarse appearance in *lapponum* are optical illusions. I have bleached specimens of *Helochares punctatus* Sharp and have observed how the apparently coarse punctuation distinctive of it becomes the fine punctuation of the form known in the British list as *H. lividus* Forst. The bleaching of *lapponum* does not give a satisfactory result, as the black blotches of colour disappear, so that the specimen looks like *flavicollis*, and therefore comparison with ordinary *fulvus* becomes impossible.

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[5] Authors, in referring to the orientation of the male genital armature of the Dytiscidae and Haliplidae, usually describe the curved aedeagus as if the concave side were the ventral side and say that, in a state of rest, the armature (aedeagus and parameres) lies on its left side, e.g. Sharp and Muir (1912, pp. 491-2), Korschelt (1924, II, pp. 292 et seq.), Guignot (1930, p. 73). Thus in the Haliplidae and in the Noterinae and Laccophilinae, in which the two parameres differ from one another, the left paramere is described as the more or less scale-like structure and the right as the one of systematic importance. A study of the movements of the armature as it is projected, turned and inserted into the vulva of the female shows clearly that if this view is correct, the aedeagus enters the vulva upside down and thus behaves differently from the aedeagus of all other Coleoptera and probably of all other insects. Edwards correctly described the parameres in *Haliplus* in 1911, and I in 1915. I described the orientation of the Dytiscid aedeagus in my text-book (1932, pp. 43-45).

H. flavicollis is usually easily separated from *fulvus* by its colouring, but specimens of *flavicollis* with dark blotches on the elytra are not infrequent. Then the only easily visible character upon which it can be recognised is the more or less straight anterior border of the pronotum as against the slightly bulging edge of the same part in *fulvus*. The males can be separated on several characters. The anterior tarsal claws are subequal in *flavicollis* and distinctly unequal in *fulvus*. The form of the aedeagus and of the left paramere is also very different in the two species.

Only one British species of this group requires a change of name. It seems quite clear that what we have known as *cinereus* Aubé is identical with *laminatus* Schaller, and this name has precedence. The first apparent British record of the species seems to be that of Power (1856) when he recorded, for Middlesex and Surrey, a species '*H. affinis* Stephens (*cinereus* Aubé).' An examination of Stephens' description of *affinis* (1828) shows definitely that this is not *cinereus*. Stephens' species is the same size as *ruficollis* and possesses 'an obsolete stria on each side [of the pronotum] as in the preceding species' [*ruficollis*]. But two or three authors use the name *affinis* and give *cinereus* as a synonym, and the two names represent one species in Waterhouse's Catalogue, 1858. After that date, however, *affinis* disappears from the British records. Zimmermann (1920) places *affinis*, with a question mark, as a synonym of *immaculatus*.

I have already stated that Guignot's subgenera correspond to Zimmermann's species-groups but they are based upon different characters. Guignot's table is as follows:—

1. Posterior tibiae without setigerous striole on inner face. Male with right[6] paramere without apical spine.
2. Upper and lower surfaces of body completely covered with closely stippled punctuation (tertiary punctuation) . *Haliplidius* (*confinis*, *obliquus*, &c.).

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[6] The right paramere referred to by Guignot is the true left. See previous footnote.

2'. **Punctuation almost absent or reduced to widely separated punctures between the elytral striae. Pronotum with latero-basal striae. Little or no tertiary punctuation.**

3. **Post-tibiae with superior marginal range of spines up to the summit. Prosternal process with a transverse border across the base.**
.... *Neohaliplus* (*lineatocollis*).

3'. **Post-tibiae with superior marginal range of spines doubled towards the apex. Prosternal process without transverse border across the base.**
.... *Haliplus* (*ruficollis*, &c.).

1'. **Posterior tibiae with a longitudinal striole on inner face. Pronotum without latero-dorsal striae. Male with right[6] paramere with apical spine.**
.... *Liaphus* (*mucronatus*, &c.).

The setigerous striole, to which Guignot refers, is easily seen by looking down upon a specimen mounted in the usual manner, since the inner face of the post-tibia is thus exposed in its full width. This striole is present in all the British species of the fulvus-group, although it varies in its length, being longest in *mucronatus* and shortest in *variegatus*, but it does not occur in any British *Haliplus* outside this group. It is, however, present in *Brychius elevatus*, where it is about as long as in *mucronatus*, and it is also present in *Peltodytes caesus*, where it is about as short as in *variegatus*. The apical spine or process on the paramere which Guignot gives as an additional character for recognising his subgenus is, however, not to be seen in *laminatus* (*cinereus*).

A much simpler key to the groups, based upon that of Zimmermann, is as follows:—

A { Upper and lower surfaces of the body covered with strong micro-punctuation; rows of elytral punctures weak .... I (confinis-group).
Little or no micro-punctuation .... B

B { Prothorax, on each side with an oblique stria, usually with a small pit on its inner side .... C.
Prothorax without longitudinal basal striae .... IV (fulvus-group).

C { Prothoracic striae deep, long and strongly curved inwards. .... II (lineatocollis-group).
Prothoracic striae short, only slightly curved .... III (ruficollis-group).

The British species are as follows:—

Haliplus Latreille (1802) = *Cnemidotus* Illiger (1802), not Erichson (1832).

Group I.

confinis Stephens (1828).
obliquus Fabricius (1787).

Group II.

lineatocollis Marsham (1802).

Group III.

ruficollis De Geer (1774).
heydeni Wehncke (1875).
fluviatilis Aubé (1836).
lineolatus Mannerheim (1844) = *transversus* Thomson (1869) = *browneanus* Sharp (1915) = *nomax* B.-B. (1911), probably a geographical form.
immaculatus Gerhardt (1877).
wehnckei Gerhardt (1877).
apicalis Thomson (1868) = *striatus* Sharp (1869).
furcatus Seidlitz (1887), see E.M.M., 1934, p. 76, and 1935, p. 201.

Group IV.

fulvus Fabricius (1801).
flavicollis Sturm (1834).
mucronatus Stephens (1828).
variegatus Sturm (1834).
laminatus Schaller (1783) = *cinereus* Aubé (1836).

Brychius was created by Thomson (1860), who separated it from *Haliplus*, the main character being the more or less square-shaped pronotum with the long, somewhat kinked stria running forward from the base on each side, near to and almost parallel with the lateral margin. Thomson also specified the genotype, *Dytiscus elevatus* Panzer, which, with certain other members of the genus, is characterised by the raised third interstrial elytral space, the ridge extending backwards from near the base for about two-thirds the length of the elytron. On the shoulder there is also a slight bulge which sometimes extends back for a short distance along the sixth interspace. Thus the only British species is easily separated from all other British Haliplidae.

Brychius Thomson, C.G. (1860).
elevatus Panzer (1794).

Addendum. In Part IV of these notes, I raised Seidlitz's subgenus *Oreodytes* to generic rank without, however, naming the type species, which is important. I therefore now designate *Hyphydrus borealis* Gyllenhal (1827, p. 386) (= *Hydroporus davisi* Curtis, 1831) as the genotype.

Winscombe Court, Winscombe, Somerset.
January, 1936.

COLEOPTERA IN WEST CORNWALL, WITH A NOTE ON THE ADDITION OF *TROGOPHLOEUS DESPECTUS* BAUDI TO THE BRITISH LIST.

BY R. T. BANNISTER, M.B., B.S.

During some years of sporadic collecting in West Cornwall, for the most part between the Lizard and the Land's End, I have come across a number of beetles apparently not recorded before from the county. One of the first of these, in September, 1932, was *Anchonidium unguiculare* Aubé, beaten from an oak tree in a small wood near Gweek. On the advice of Mr. J. H. Keys, who introduced the species to the British list in 1916 on a specimen taken in 1893 in the valley of the Yealm in Devon, I set traps of bracken fronds under the trees and was lucky enough to get a second specimen. Since then I have tried in vain for more, though the same wood yielded *Oxypoda amoena* F., *Gyrophaena convexicollis* Joy, and other species.

The long strip of sandy shore from Carbis Bay to beyond Hayle provides a number of maritime species in good numbers, among them *Phytosus spinifer* Curt., *balticus* Kr., *nigriventris* Charp., *Arena octavii* Fauv. (two specimens), *Diglotta mersa* Hal., and many more. On the sandhills behind, a fair variety of species occur. A dead rabbit left here as a trap last summer gave me a large male of *Philonthus rectangulus* Shp., some commoner *Philonthi, Aleocharae* and *Athetae, A. divisa* Märk. being specially numerous, *Thanatophilus sinuatus* F., *Necrophorus interruptus* Steph., *humator* Goeze, *investigator* Zett., *Necrobia ruficollis* F., and other carrion feeders. Under the sandhill plants, *Orthochaetes setiger* Beck, *insignis* Aubé, *Tychius flavicollis* Steph., *Mecinus circulatus* Marsh., etc., occur.

Near Torpoint, a small *Trogophloeus* from shingle at the side of the estuary has been identified as *despectus* Baudi, new to the British list. *T. despectus* Baudi is a little broader than *halophilus* Kies., but is much like it in general aspect. The antennae are shorter, with joints 9 and 10 about one-half broader than long and joints 4 to 6 shorter than in *halophilus*. The thorax is slightly but perceptibly sinuate before the posterior angles, and the elytra distinctly punctured throughout. The punctuation is very clear and distinct from that of *T. halophilus* under a magnification of × 120 in daylight. The elytra are more transverse than those of *T. pusillus* Gr. A single specimen only was taken. Dr. Cameron has kindly confirmed the determination of the specimen.

Mr. Keys, who has introduced so many species to the Cornish list, especially from the Lizard district, has determined or confirmed all the more difficult species for me and helped in other ways. The Rev. A. Thornley has kindly given me access to his Cornish records, and checked the list for me.

The following are the species not previously recorded as Cornish which I have taken here :—

Blethisa multipunctata L., *Oxypoda sericea* Heer, *O. lentula* Er., *O. amoena* F., *Hygropora cunctans* Er., *Zyras collaris* Payk., *Metaxya tomlini* Joy, *M. malleus* Joy, *M. hygrotopora* Kr., *Dinarea linearis* Gr., *Atheta gagatina* Baudi, *A. reperta* Shp., *Dimetrota nigripes* Th., *Meotica exillima* Shp., *M. exiliformis* Joy, *Homalota plana* Gyll., *Gyrophaena poweri* Crotch, *G. lucidula* Er., *G. convexicollis* Joy, *Arena octavii* Fauv., *Myllaena dubia* Gr., *M. minuta* Gr., *Bolitobius exoletus* Er., *Philonthus rectangulus* Shp., *Astenus immaculatus* Steph., *Stenus incrassatus* Er., *Bledius fracticornis* var. *laetior* Muls., *B. opacus* Blk., *Trogophloeus despectus* Baudi, *Omalium rugulipenne* Rye, *Phloeonomus lapponicus* Zett., *Xylodromus concinnus* Marsh., *Catops fuliginosus* Er., *C. morio* F., *Euconnus hirticollis* Ill., *Scydmaenus tarsatus* L., *Reichenbachia impressa* Panz., *Bibloplectus ambiguus* Reich., *Saprinus immundus* Gyll., *Omosita depressa* L., *Meligethes ochropus* Stm., *Trachys troglodytes* Gyll., *Anchonidium unguiculare* Aubé, *Notaris bimaculatus* F., *Gymnetron veronica* Gm., *Ceuthorrhynchus rapae* Gyll., *C. asperifoliarum* Gyll., *C. palustris* Edm.

Trelorgan, Lidden, Penzance.
March 4th, 1936.

FURTHER NOTES ON THE NEUROPTERA (SENS. LINN.) OF KINTYRE.

BY KENNETH J. MORTON, F.R.E.S.

In Vol. LXIX, pp. 220-223, of this Magazine, I gave some notes on collecting near Tayvallich in the spring of 1933. The results were sufficiently encouraging to lead us to visit the district twice in 1935—in the spring between 11th May and 7th June, and in the early autumn from 24th September to 7th October. It was realised beforehand that the second period was rather late, and the weather proved mostly wet. Needless to say, we had full experience of the unseasonable cold which occurred in May. The 11th was decidedly warm; the 12th was on the whole one of our best days, when *Libellula quadrimaculata* and *Pyrrhosoma nymphula* were emerging freely at a small bog near the house (some of the latter being fully adult), and other kinds of insect life were in plenty. But the cooling-down process had already begun, and in spite of the sunshine, which continued, it became increasingly colder from day to day with a bitter wind. On the 16th, after a bright but very cold forenoon, sleet showers fell in the afternoon, passing into snow at night. Next morning the whole countryside was white even to the beach. The snow disappeared at once from the low ground, and later we had a good deal of sunshine, but its value was too often lessened by a rather strong, cool, dry wind, which retarded things. However, as on this occasion I collected over a wider area, which included one or two fresh-water lochs, I was able to add a number of species to my former list.

From 11th to 24th May we lived near Tayvallich, the rest of our time to 7th June at Carsaig Bay on the Sound of Jura. The village of Tayvallich lies around the head of a short western arm of Loch Sween named Loch a' Bhealaich; immediately behind the village the ground rises slightly and drops to a low-lying flat which stretches to Carsaig Bay, the distance between the two places being little more than half a mile. When at Tayvallich I collected mostly to the north of this neck; from Carsaig Bay more frequently to the south, the woods in the direction of Taynish and the Loch of that name being specially attractive.

Dealing first with the dragonflies, there was no evidence that these were seriously affected by the cold. On the days preceding the 16th they were occasionally met with in the woods, no doubt driven thither from the neighbouring bog by the strong, cold wind, and by the 20th *L. quadrimaculata* and *P. nymphula* were again stirring but still showing a preference for the shelter of the woods. On my first visit to Loch Taynish on the 28th I found, in addition to the two species mentioned, *Ischnura elegans* and *Enallagma cyathigerum*, all the species, especially the *Ischnura*, in good numbers. On the 30th these species were reinforced at the Loch by a fair number of *Agrion puella*, a species of which two males had been noted the previous day at the sluggish lower part of the Carsaig burn not far above where the burn falls into the Bay, a few *I. elegans* being also found at the same place. On the 28th at a small burn which drains a hollow in the hills to the north of the Bay and which enters it not far from the mouth of the Carsaig burn, I found a few specimens of *Calopteryx virgo*. Next day at the same burn my eye caught sight of a newly emerged ♂ of *Cordulegaster annulatus* clinging to the rocky bank, with its exuviae, the only example of the species seen on the present occasion. On the 30th *C. virgo* was found to be rather common on the higher parts of Carsaig Burn, making the third stream at which it has been observed in the Tayvallich district, all of them north of the neck.

Agrion puella is, I believe, a new record for the Vice-County, and rather curiously this is the first occasion I have actually taken it in Scotland, although I have a rather distinct recollection of seeing it in my earliest collecting in Lanarkshire at a small bit of marsh which soon afterwards was completely drained. Selys (Revue des Odonates, 1850) mentions it from Scotland, more probably on the strength of specimens existing in the old Scottish collections which he examined than of personal captures, while Lucas (Brit. Dfls., 1900) said it apparently did not exist in Scotland. Evans, however (Ann. Scot. N.H., 1911), was able to record it from four counties, and there can be no doubt that the distribution of the species in Scotland is still very imperfectly known. With us it seems to occur rather early, and in many seasons its period of flight may be comparatively short, causing it to be overlooked. No trace of it was found when I collected at Loch Taynish on 27th August, 1920, although *E. cyathigerum* and *Ischnura elegans* were still common enough there.

Perhaps I should refer to another promising locality for dragonflies, a loch known locally by the appropriate name of the Lily Loch, which lies on the higher ground about a mile north of Carsaig Bay. A rough road can be used most of the way to it, but I approached it more directly by a ravine, one side of which presented a fine range of cliff. My two visits were sunless, but it produced *L. quadrimaculata, P. nymphula, E. cyathigerum* and *I. elegans*.

Turning to NEUROPTERA (s.str.): Hemerobiidae fell far short of the results of 1933. My captures of *Hemerobius perelegans* were all made between 20th and 24th May, when the species seemed to make an immediate response to the milder conditions. However, the numbers only reached a half of those of 1933. All were taken in the woods to the north of Tayvallich; none could be found in the wooded area in the neighbourhood of Loch Taynish, although this appeared to be equally promising. *Boriomyia nervosa* was more generally distributed but proportionally scarcer than *H. perelegans*, as its numbers did not mark quite a fourth of those obtained in 1933. Of *Hemerobius micans*, one was beaten from hazel near Carsaig on the 16th, one of our coldest days; another near Tayvallich on the 22nd. *H. lutescens* was represented by a single teneral ♂ taken on 1st June near Loch Taynish. In other years I have taken *B. nervosa* in Lanarkshire and the Isle of Arran during the last ten days of April, so it may be assumed that in the warmer weather that preceded the cold of

May, a fair proportion, perhaps even the greater part, of the spring broods of *B. nervosa* and *H. perelegans* had emerged and oviposited before the cold spell. But judging from observations of the summer brood of *B. nervosa* in Midlothian, that species had not done very well in 1935 and the same may be said of some of the other Hemerobiids.

Chrysopidae were poorly represented by five examples in all: *Chrysopa flava* (1), which did not appear in my previous list, *C. vittata* (1) and *C. ciliata* (3). While the emergence of these insects was evidently retarded by the cold, there is no reason to doubt that after we left they shared in the rather unusual prosperity which the same species enjoyed in Midlothian during June and July.

Sisyra fuscata was not noticed until 6th June, when a number were seen at Loch Taynish, where doubtless it is a common species. No Coniopterygidae were seen.

MEGALOPTERA: *Sialis lutaria*, which I had no opportunity of taking in 1933, proved to be abundant at the Lochs, and a few *S. fuliginosa* were noted at the burns.

MECOPTERA were on this occasion represented by *Panorpa germanica* only. It was already out when we arrived and soon reappeared after the snow. It was generally distributed and common. At one place near the Lily Loch on 5th June it appeared in rather unusual numbers.

The following TRICHOPTERA not mentioned in my previous list were taken: *Limnophilus marmoratus* and *lunatus*, *Sericostoma personatum*, *Goëra pilosa*, *Mystacides azurea*, *Oecetis ochracea* (rather common at Lily Loch) and *Tinodes waeneri*.

The results of the autumn visit may be given in a few words. Our quarters were as in May, 1933, and collecting was restricted to the immediate neighbourhood. On account of the very unsettled weather and distances, the Lochs were not visited. Seven Hemerobiids in all were taken: *B. nervosa* (2) and *H. marginatus* (5), all females. The latter has not to my knowledge been previously recorded from the district, although I found it on the east side of Loch Sween in August, 1920. A good many larvae of Chrysopas were seen but no adults. The only additional Trichoptera obtained were the three autumnal species, *Halesus digitatus* and *radiatus* and *Chaetopteryx villosa*.

13 Blackford Road, Edinburgh.
February 24th, 1936.

NOTES ON BRITISH METOPIINI (HYM. ICHNEUMONIDAE).

BY J. F. PERKINS, B.SC.
(Department of Entomology, British Museum).

The late Dr. James Waterson rearranged the British collection of Metopiini in the British Museum, but he unfortunately left no notes on the species, although he found some interesting facts. Later certain other points have been discovered, and it has been thought advisable to publish these few notes on our species.

The species of this genus had been considerably confused in this country. Of the species given in the key, two have previously remained unrecognised although they were present in old collections, namely *Peltocarus croceicornis* Thoms. and *Metopius leiopygus* Foerst. However, it is actually more probable that *Ichneumon chrysopus* Lewin is synonymous with *P. croceicornis* Thoms. than with *P. dentatus* Fab., with which Clement has synonymised it. If this is so, then this species is not an addition to the British list. Since the specimen bred by Lewin cannot yet be found, it is impossible to be certain of this synonymy. *M. leiopygus* is actually one of the commoner species of this tribe in Britain, and *M. micratorius* (Fab.) Clem., with which is is closely related, is rare.

Of the species recorded by Morley (British Ichneumonidae, IV) I have yet seen no specimen of *M. fuscipennis* Wesm. From the description he gives I suspect that the specimen he records, taken in Devon by Edmonds, is really a specimen of *M. dissectorius*, with which it is extremely closely related. *Metopius peltator* Marsh. is (as given by Clement) a synonym of *Metopius anxius* Wesm. *M. dissectorius* Panz. has of course the acute horn on the frons.

It has also been thought advisable, at present, to keep *Peltocarus* Thoms. and *Metopius* Panz. as distinct genera, but to regard *Peltopius* Clem, and *Ceratopius* Clem. as sub-genera of *Metopius*.

The key is based on that of Clement (Konowia 1929, VIII, 325-437) on the Palaearctic species of *Metopius*, s.l.

MALES and FEMALES.

1. Second recurrent nerve of forewings with two fenestrae; the keel between the antennae produced on to the face shield (Fig. 1); the hind femora not strongly thickened; the lower tooth of the mandibles stronger and nearer to the apex of the mandibles; lateral keels of the scutellar fovea yellow .... **Peltocarus** Thoms. 2

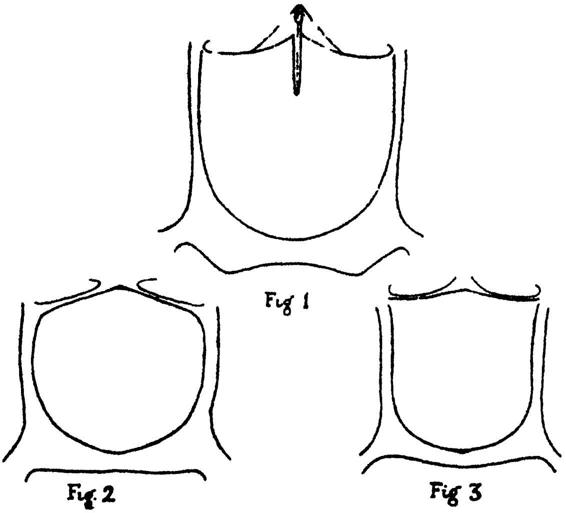
— Second recurrent nerve of the forewings with one fenestra; the keel between the antennae not produced on to the face shield (Figs. 2 and 3); the hind femora more strongly thickened, the lower tooth of the mandibles short and far removed from the apex of the mandible; lateral keels of the scutellar fovea black .... **Metopius** (Panz) Clem. 3

2. Lower edge of the face shield incomplete centrally; abdominal segments strongly transverse; flagellum orange. (♂ with the face black centrally as in the ♀) .... *P. croceicornis* Thoms.

— Face shield complete; abdominal segments sub-quadrate; flagellum black above. (♂ with the face entirely yellow; ♀ with the face black centrally).

(*a*) Second tergite with a complete apical band ...... *P. dentatus* Fab.

(*b*) Second tergite with the apical band broadly interrupted centrally .... *P. dentatus* var. *interruptus* Thoms.



FACE SHIELDS.

FIG. 1. *Peltocarus dentatus* Fab.
FIG. 2. *Metopius anxius* Wesm
FIG. 3. *Metopius leiopygus* Foerst.

3. Face shield distinctly longer than broad, the sides sub-parallel and the upper corners more sharply angled; cheeks shorter (Fig. 3) 4

— Face shield sub-oval, about as long as broad, rounded laterally; cheeks longer (Fig. 2). (Costa of forewings somewhat infuscate; face of both sexes only yellow on the dorsal and lateral margins of the face shield; the frontal orbits black) .... *M. anxius* Wesm.

4. Frons with a distinct horn; forewings distinctly infuscate along the costa; first segment of the abdomen as long as broad. (Face of both sexes only little marked with yellow) 5

— Frons with only the keel between the antennae; forewings at most only yellowish along the costa; first abdominal segment usually transverse. (Face of the ♂ yellow, of the ♀ only little marked with yellow) ... 6

5. Tergites 2 to 4 with at most a weak central keel; mesopleura very closely punctured, sub-rugose, the distance between the punctures less than half the diameter of the punctures. (Hind angles of the scutellum with the lateral keels less sharply pointed) .... *M. dissectorius* Panz.

— Tergites 2 to 4 with a distinct central keel; mesopleura less closely and more coarsely punctured. (Hind angles of the scutellum with the lateral keels more sharply pointed) .... *M. fuscipennis* Wesm.

6. ♀ with the 6th tergite, ♂ with the 7th differing conspicuously in sculpture from the preceding segment, laterally and apically with weak, shallow and ill-defined punctures but more strongly punctate centrally and basally .... *M. leiopygus* Foerst.

♀ with the 6th tergite, ♂ with the 7th similar in sculpture to the preceding segment, though the sculpture is finer ...... *M. micratorius* (Fab.) Clem.

The following British material has been examined. I wish to thank the Essex Field Club, the Castle Museum, Norwich, and the Plymouth Municipal Museum for the loan of the material from the Fitch, Bridgman and Bignell collections.

1. **Peltocarus croceicornis** Thoms.

1 ♂ Stephens Coll.; 1 ♂ Marshall Coll.; 1 ♀ Desvignes Coll.

2. **Peltocarus dentatus** Fab.

1 ♂ Stephens Coll.; 2 ♂♂ Desvignes Coll.; 1 ♂ Sunderland, A. F. Griffiths, and 1 ♂ Sunderland, ex *Lasiocampa quercus* L., var. *callunae* Palm., 1890, Bridgman Coll.; 1 ♂ Cross Craig, Rannoch, E. C. Rye, Fitch Coll.; 1 ♀ bred May 16, Desvignes Coll.; 1 ♀ Marshall Coll.; 1 ♀ Rannoch, W. H. B. Fletcher, and 1 ♀ ex *L. quercus* L., var. *callunae* Palm., Bridgman Coll.; 1 ♀ ex *L. quercus* L., var. *callunae* Palm., vii.1890, A. B. Farn, and 1 ♀ Bignell Coll.; 1 ♀ Fitch Coll.

var. **interruptus** Thoms.

1 ♂ Desvignes Coll.; 1 ♂ ? Carlisle, B.M. Coll.

3. **Metopius anxius** Wesm.

1 ♂ Leach Coll.; 1 ♂ Stephens Coll.; 1 ♂ Desvignes Coll.; 1 ♂ bred, 30.iv.1921, Whittle Coll.; 1 ♂ Fitch Coll.; 1 ♂ Milford, on whitethorn blossom, June 1, 1866 (Type of *M. peltator* Marsh.), Marshall Coll.; 1 ♀ and 1 ♀ ex *Stauropus fagi* L., Stephens Coll.; 1 ♀ Desvignes Coll.; 1 ♀ New Forest, vi.1894, Bignell Coll.; 1 ♀ bred, 25.iv.1920, and 1 ♀ bred, 30.iv.1921, Whittle Coll.

4. **Metopius dissectorius** Panz.

2 ♀♀ Stephens Coll.; 1 ♀ Fitch Coll.; 1 ♀ Desvignes Coll.; 2 ♀♀ Dartmoor, Lustleigh, 24 and 25.viii.1934, R. C. L. Perkins, B.M. Coll.

5. **Metopius fumipennis** Wesm.

I have seen no British specimens of this species.

6. **Metopius leiopygus** Foerst.

1 ♂ and 1 ♂ ex *Stauropus fagi* L. (label written by C. Morley), Stephens Coll.; 2 ♂♂ Desvignes Coll.; 1 ♂ Clifton Coll.; 1 ♂

Brundall (Norfolk), 5.viii.1878, Bridgman Coll.; 3 ♀♀ Stephens Coll.; 1 ♀ Desvignes Coll.; 1 ♀ Marshall Coll.; 1 ♀ Bignell Coll.

7. **Metopius micratorius** Fab.

1 ♂ Ely, W. J. Cross, Bridgman Coll.; 1 ♂ Huntingdonshire, 2.vii.1924, ex *Zephyrus quercus* L., B.M. Coll.; 1 ♀ Deal, viii. 1892, Bignell Coll.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
March 18th, 1936.

COLLEMBOLA FROM GRIMSEY ISLAND, NORTH ICELAND.

BY W. MALDWYN DAVIES, B.SC., PH.D., F.R.E.S.

The reports of collections of Collembola from polar regions are now quite numerous, for it would seem that most expeditions have returned with specimens of this interesting Order of Insects, which is often the sole representative of the Insecta in these areas. Naturally, the range of species under these conditions is not extensive, and often the species found are similar in the different areas. Most of the species recorded are those which commonly occur in quantity, and thus are readily seen by collectors. It would seem worth while in future expeditions to examine the soil, moss and herbage fauna by means of a Berlese funnel, or by transference of such material into containers of water, when the minute species of Collembola will float and can be picked off. Such methods would indicate whether or not the more minute species, some of which are widely distributed, exist under Arctic conditions.

It is always of interest to record collections of these wingless insects from islands and such isolated ecological zones; and whereas records are available from other isolated regions in the Arctic, viz. *Spitsbergen* (Lubbock, 1899; Schaffer, 1900; Skorikow, 1900; Schtscherbakow, 1899; Carpenter and Phillips, 1922; and, recently, Brown, 1936); *Bear Island* (Wahlgren, 1900; Carpenter and Philips, 1922); *Franz-Josef Land* (Carpenter, 1900); *Alaska* and *North-West Territories*, Canada (Folsom, 1902 and 1919); *Lapland* (Agren, 1904; Carpenter, 1900); *Jan Mayen* (Wahlgren, 1900); it is strange that hitherto there have been no records of Collembola from Iceland. I am particularly grateful, therefore, to the Department of Entomology, British Museum, for the opportunity of examining the collection of Mr. P. F. Holmes, who, along with a small expedition from Cambridge, spent three weeks collecting on Grimsey Island, which lies forty miles north of Siglafjörd on the north coast of Iceland. I am deeply indebted to Mr. Holmes, also, for interesting notes which he has kindly given me to accompany these records. Grimsey Island is about three miles long and one mile across, and lies just on the Arctic Circle. The land is mainly grassland with fourteen farms and about a hundred and twenty inhabitants.* Dry conditions prevailed during the period of collection, which extended from June 22nd to July 12th, 1934.

The collection yielded seven species :—

Hypogastrura armata (Nic.).
Hypogastrura viatica (Tullb.).
Onychiurus armatus var. *arcticus* (Tullb.).
Isotoma viridis (Bourl.).
Lepidocyrtus lanuginosus (Gmel.).
Sminthurides aquaticus var. *levanderi* Reut.

Order COLLEMBOLA Lubb.
Sub-order ARTHROPLEONA Börn.
Family **Hypogastruridae** Börn.

Hypogastrura armata (Nic.).
Syn. 1841. *Podura armata* Nicolet, Nouv. mém. Soc. Helv. Sci. Nat. CX, vi, p. 57.
1912. *Hypogastrura armata* (Nic.) Linnaniemi, Acta. Soc. Sci. Fennicae, xl, No. 5, p. 13.

Specimens were collected in quantity on a dead and decaying Arctic Tern, 6.vii.34. They were all similar in colour, mottled, pale violet. This species is cosmopolitan, and other arctic records include Spitsbergen, Greenland and Siberia.

Hypogastrura viatica (Tullb.).
Syn. 1872. *Achorutes viaticus* Tullberg, K. Svensk. Vetenskakad. Handl., x, No. 10, p. 50.
1912. *Hypogastrura viatica* (Tullb.) Linnaniemi, Acta. Soc. Sci. Fennicae, xl, No. 5, p. 19.

This species was taken in abundance on the mud at the edge of a pond, which was well manured by bird droppings. A large ' swarm ' of this species was present on 6.vii.34, completely covering about a square foot of mud.

Hypogastrura viatica has a world-wide distribution and has been commonly recorded from Arctic areas, including Spitsbergen, Bear Island, Novaya Zemlya, Greenland and N. Siberia, and is equally common in the Antarctic.

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* A full account of the geographical and agricultural conditions of the island is given by D. B. Keith and E. W. Jones in the *Geographical Journal*, LXXXVI, 2, August 1935, pp. 144-152.

Family **Onychiuridae** Börn.

Onychiurus armatus var. *arcticus* (Tullb.).

Syn. 1876. *Lipura arctica* Tullberg, Ofv. K. Svensk. Vetenskakad. Förhandl., No. 5, p. 39.

1904. *Onychiurus armatus* var. *arctica* Ågren., Ark. Zool., 2, p. 11.

This large variety (specimens up to 4 mm.) of the common and widespread species *Onychiurus armatus* (Tullb.) was recorded as abundant on the steep eastern cliffs (200-350 feet high). They were found in moist, shaded crevices and cracks, and also underneath vegetation on the cliff. These cliffs were always kept moist by the sea mist. This species was not found elsewhere.

The variety *arcticus* is characteristically Arctic in distribution and has been recorded from North Scandinavia, North Russia, Spitsbergen, Novaya Zemlya, Bear Island, Jan Mayen Island, Greenland, and North Siberia.

Family **Isotomidae** Börn.

Isotoma viridis Bourl.

Syn. 1839. *Isotoma viridis* Bourlet, Mem. Soc. Sci. Agric. Lille, p. 25.

A few specimens of this, another species of world-wide distribution, were collected under stones in different parts of the island. Previous records from Arctic regions include Spitsbergen, Bear Island, Novaya Zemlya, Jan Mayen Island, Greenland, N. Siberia and Alaska.

Isotoma violacea (Tullb.).

Syn. 1876. *Isotoma violacea* Tullberg, Ofv. K. Svensk. Vetenskakad. Förhandl., No. 5, p. 36.

This species was collected in small numbers from the moss (*Pseudoleskia bridleri*) growing on stones, 28.vi.34.

Isotoma violacea has not been recorded from many Arctic areas but has been taken on Barents Island, Spitsbergen, and from Scandinavia.

Family **Entomobryidae** Börn.

Lepidocyrtus lanuginosus (Gmelin) Tullb.

Syn. 1788. *Podura lanuginosa* Gmelin, Linnaei Syst. Nat. I, 6, p. 2911.

1872. *Lepidocyrtus lanuginosus* Tullberg, K. Svensk. Vetenskakad. Handl., x, No. 10, p. 38.

One solitary specimen of this species was included in the collection, and was found on the rocks at 300 feet, 26.vi.34.

Although a common species throughout Europe and N. America, it has only previously been recorded from West Island, Spitsbergen, and N. Siberia in the Arctic region.

Sub-order SYMPHYPLEONA Börn.

Family **Sminthuridae** Lubb.

Sminthurides aquaticus var. *levanderi* Reut.

Syn. 1890. *Sminthurus apicalis* var. *levanderi* Reuter, *in litteris*.
1891. *Sminthurus apicalis* var. *levanderi* Reuter, Medd. Soc. pro. F. et Fl. Fenn., xviii, p. 232.
1893. *Sminthurus aquaticus* var. *levanderi* Schött, K. Svensk. Vetenskakad. Handl. xxv, No. 11, p. 37.

This very distinctive variety was taken in quantity on water and on mud of a drying-up pool, 8.vii.34.

It has been previously recorded from Scandinavia, North-West Territory (Canada), Russia and Germany, and has a more northerly distribution than the principal form.

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March 18th, 1936.

LYMANTRIIDAE FROM NORTH YUNNAN.

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I have recently published (Ann. Mag. Nat. Hist. (10) **17**: 329-346, 1936) a paper on some Lymantriidae from North Yunnan. These were collected by Mr. H. Höne, of Shanghai, in the year 1934. I have now received for determination a further collection from the same area, made by him in May and June, 1935, and from it have selected two further species of *Dasychira* for description. These two species, one of them represented by a series of over 40 specimens, were taken near the snow line at 12,000 feet, an unusual altitude for Lymantriidae.

The collection and types have been returned to the Zoologisches Museum der Universität, Berlin, while paratypes have kindly been presented to the British Museum (Natural History).

Dasychira anophoeta sp. nov.

♂. Palpus, head and thorax fuscous, mixed with a few hair-scales of pale pinkish buff, the latter colour predominating on the frons. Antenna ochraceous tawny, darker towards the end of the shaft. Abdomen raw sienna, at the base fuscous, anal tuft pale pinkish buff mixed on the upper side with fuscous. Pectus and venter fuscous mixed with pale pinkish buff, the tarsi pale pinkish buff ringed with fuscous. Venter pale pinkish buff. Forewing fuscous mixed with hair brown; a whitish patch over the base of the wing, reaching the antemedial area; an indistinct fuscous double antemedial fascia; discocellulars edged narrowly with fuscous; a fuscous postmedial fascia, crenate, outwardly oblique from costa to vein R_5 (this portion bordered on each side with pale pinkish buff), thence inwardly oblique to a point below the discocellulars, thence to the inner margin at right angles; an irregular fuscous subterminal fascia; fringe fuscous, lighter at the vein-ends. Hindwing pale pinkish buff, the fringe somewhat lighter. Underside of forewing a uniform Saccardo's umber, save for a narrow whitish stripe along the costa from the antemedial to the subterminal area, crossed by the postmedial fascia, which is otherwise obsolete; fringe Saccardo's umber, lighter at the vein-ends. Underside of hindwing, and fringe, whitish.

Expanse: ♂♂ 45-53 mm.

1 ♂ (holotype) and 1 ♂ (paratype), 12,000 ft., 1st June and 31st May, 1935, Li-kiang, North Yunnan.

A very distinct species, which may be placed near to *Dasychira varia* Walker.

Dasychira oxygnatha sp. nov.

♂. Palpus pale pinkish buff, on the outer side fuscous. Antennal shaft white, ringed distally with fuscous, pectinations ochraceous tawny. Head and thorax white, mixed sparsely with fuscous, giving a grey effect; a patch of fuscous in the centre of the thorax. Abdomen fuscous mixed sparsely with white; the base white with a dorsal stripe of fuscous black; anal tuft white. Pectus, venter and legs whitish, the tibiae and tarsi spotted and banded with fuscous. Forewing white, irrorated faintly with fuscous; an irregular subbasal fascia, angled outwardly in the cell; a broad and conspicuous patch of fuscous, commencing at the costa midway between subbasal and antemedial fasciae, and in average specimens reaching as far as the lower margin of the cell; a fuscous antemedial fascia, directed roughly at right-angles to the inner margin, crenate, points on the veins; discocellulars edged narrowly with fuscous; a fuscous postmedial fascia, crenate, points on the veins, bowed (convexity terminad) to vein *Cu2*, thence outwardly oblique to the inner margin; a fuscous subterminal fascia, parallel with the termen, crenate, points on the veins; fringe white, mixed interneurally with fuscous. Hindwing white, shaded below the cell with fuscous; a patch of fuscous on the discocellulars; a broad subterminal fuscous shade, finishing at the anal angle; a conspicuous and rather broad terminal streak of fuscous, reaching from the apex almost to the anal angle; fringe white. Underside of forewing white, marked with fuscous along the costa and on discocellulars; a postmedial and a subterminal fascia, fuscous and almost straight; a streak of fuscous along the termen, broken at the veins; fringe white. Underside of hindwing white; traces of postmedial and subterminal fasciae, and a streak of fuscous along the termen, broken at the veins; fringe white.

♀. Resembles the ♂.

Expanse: ♂♂ 47-58mm., ♀♀ 58-64 mm.

1 ♂ (holotype), 1 ♀ (allotype), 35 ♂♂ and 4 ♀♀ (paratypes), 12,000 ft., 26th May—1st June, 1935, Li-kiang, North Yunnan. In the British Museum collection, ex Oberthür collection, are 2 ♂♂ and 3 ♀♀ from Ta-tsien-lou, Siao-lou, Tay-lou-ho and Tchang-kou, all of which seem to be referable to this species.

Resembles *D. cinctata* Moore (Darjeeling), in which the postmedial fascia on the forewing is not crenate and the subterminal fascia further from the termen; the genitalia also show differences, the ventral portion of the valve in *D. cinctata* being shorter, rounded at the tip and broader at the base. *D. postfusca* Swinhoe (Khasis) and *D. lunulata* Butler (Japan) are allied but perfectly distinct species.

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March 18th, 1936.

A CHECK LIST OF THE HIPPOBOSCIDAE AND NYCTERIBIIDAE PARASITIC ON BRITISH BIRDS AND MAMMALS.

BY GORDON B. THOMPSON
(Department of Entomology, British Museum (Natural History)).

HIPPOBOSCIDAE.

Genus HIPPOBOSCA Linnaeus (1758).

1. *Hippobosca equina* Linnaeus (1758).

Genus MELOPHAGUS Latreille (1802).

2. *Melophagus ovinus* (Linnaeus) (1758).

Genus LIPOPTENA Nitzsch (1818).

3. *Lipoptena cervi* (Linnaeus) (1758).
Genus STENEPTERYX Leach (1817).
4. *Stenepteryx hirundinis* (Linnaeus) (1758).
Genus CRATAERINA Olfers (1816).
5. *Crataerina pallida* (Latreille) (1812).
Genus ORNITHOMYIA Latreille (1802).
6. *Ornithomyia avicularia* (Linnaeus) (1758).
7. *Ornithomyia lagopodis* Sharp (1907).
8. *Ornithomyia fringillina* Curtis (1836).
Genus LYNCHIA Weyenbergh (1881).
9. *Lynchia ardeae* (Macquart) (1835).

NYCTERIBIIDAE.

Genus NYCTERIBIA Latreille (1796).
Subgenus *Listropoda* Kolenati (1857).
10. *Nycteribia* (*Listropoda*) *latreillei* Leach (1817).
Subgenus *Celeripes* Montagu (1815).
11. *Nycteribia* (*Celeripes*) *biarticulata* (Hermann) (1804).

NOTES.

(1) The generic names of the two species found parasitising the Swift (*Apus apus apus* (L.)) and the Martin (*Delichon urbica urbica* (L.)), according to the original descriptions, should be spelt *Crataerina* (1816) and *Stenepteryx* (1817).

(2) The date of publication of *Crataerina pallida* (Latreille) is usually given as 1811, but according to Sherborn and Woodward (1906) is 1812.

(3) In the genus *Ornithomyia* three species are listed as occurring in our islands. The familiar species are *Ornithomyia avicularia* Linn. and *Ornithomyia lagopodis* Sharp. Through the kindness of Mr. J. Clark, of the Australian National Museum, I was able to examine the only preserved specimen of Curtis' *Ornithomyia fringillina*, which bears a label with '*fringillina*' written on it in Curtis' own handwriting. Three specimens were listed by Curtis in the original description. The solitary specimen agrees in every respect with the common, smaller species of *Ornithomyia* described by Bergroth as *Ornithomyia chloropus* (1901); the latter name therefore falls as a synonym.

The head is distinctly wider than high. The vertex is moderately long, so that the anterior ocellus lies slightly below a line drawn through the upper orbits. Inner orbital bristles few, in two widely separated groups (two placed about the middle, three near the lower edge); gula (ventrally) with setae only on the low, somewhat converging ridges separating the infrabuccal membrane

from the postgenae; no postorbital setae. Ocelli small. Frons nearly twice the width of an eye. Fronto-clypeus with a shallow median pit-like depression near the upper margin. Scutellum fringed with short, sparse hairs along the extreme hind margin and with two pair of preapical bristles, of which the inner pair is much the longer; disc otherwise bare. Humeral angles short and broad, barely reaching beyond the upper margins of the eyes. Wing short, 5 mm. long; apical section of costa about two-thirds of the length of the penultimate section; second basal cell (M) short and of normal width, closed by an anterior basal cross-vein (*m-cu*) which is about twice the length of its distance from the anterior cross-vein (*r-m*); anal cell (1st An) much less than half the length of the second basal cell. Length (from tip of palpi to tip of abdomen), in dry condition, 3.6 mm.

(4) In the case of the two species of Nycteribiidae recorded from British bats there are three changes. These alterations have already been pointed out by Musgrave (1925). The name of the subgenus in which *latreillei* Leach is placed should be spelt *Listropoda*, not *Listropodia*. *Listropoda* is the spelling given by Kolenati when he introduced the name (1857, p. 62); later, however, he used *Listropodia*. Latreille's *Nycteribia pedicularia* was proposed as a new name for Linnaeus' *P. vespertilionis* and therefore passes into the synonymy of the Linnean species and cannot be used in place of Leach's *latreillei*. The old subgeneric name *Stylidia* Westwood (1840) must be replaced by *Celeripes* Montagu (1808 and 1815). *Celeripes* was introduced by Montagu as a *nomen nudum* in 1808 and in 1815 he described the insect under the generic name *Nycteribia*, but cited *Celeripes* in the synonymy. According to the international rules of nomenclature, this validates the name and it therefore replaces the *Stylidia* of twenty-five years later. The type of the subgenus is the same in both cases, i.e. *Phthiridium biarticulata* Hermann (1804).

(5) The list of Hippoboscidae and Nycteribiidae at present contains eleven valid species which have been recorded from the British Isles. It is possible, however, that further collecting will add more species to our list. Possible species are the following: —*Pseudolynchia maura* (Bigot) (1885), a common parasite of domestic pigeons in most parts of the world, which has recently been recorded by Séguy (1932) from a *Columba palumbus palumbus* L. (Wood Pigeon) killed at Moret-sur-Loing, 21.vii.1932 (*M. Royer*); *Ornithomyia biloba* Dufour (1827), an apparently common parasite of the Swallow (*Hirundo rustica rustica* L.) on the Continent; *Ornithoica* sp., the genus *Ornithoica* contains very small species which on account of their size may easily be overlooked. Concentrated collecting off bats may yield another species of Nycteribiid and possibly a Streblid.

Finally, I should like to express my gratitude to Dr. Jos. Bequaert for much kind help in connection with my studies on the Hippoboscidae.

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MALLOPHAGA ON A BIRD'S EGG.

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Through the kindness of Mr. H. St. J. Donisthorpe and the authorities of the Hope Department, University Museum, Oxford, I have recently had the opportunity of examining two Mallophaga collected by Mr. Donisthorpe off an egg of a Lapwing (*Vanellus vanellus* (L.)), Scotland, Tiree Island, 28.iv.1912 (1913/1231). The specimens represent two species: *Actornithophilus* sp.,[1] 1 ♀, and *Menopon lutescens* Nitzsch, 1 ♀.

Records of lice having been found in situations other than on the hosts appear to be very few.[2] A cursory glance through the literature has revealed the following: (1) Evans (1912) records the species *Menopon lutescens* Nitzsch from the nest of a Lapwing (*Vanellus vanellus* (L.)), Scotland, Aberlady, v.1906; (2) Waterston (1923) records the species *Actornithophilus milleri* (Kellogg & Kuwana) taken from a nest of *Anous stolidus stolidus* (Linn.) at St. Paul's Rocks by Capt. G. H. Wilkins during the voyage of the

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[1] Probably *ochraceus* Nitzsch. but in the absence of a male I cannot be sure.

[2] I have not included here the numerous instances which have been recorded of lice being found attached to Hippoboscidae and Culicidae and the single instance recorded by Cummings (1913) of the finding of a fragmentary specimen of a Philopterid on a bee.

'Quest'; (3) Ewing (1930) records a single female of *Dennyus dubius* (Kellogg) from the nest of *Chaetura pelagica* (Linn.) at Maywood, Virginia, U.S.A., 22.vii.1926; (4) Theobald in his book 'Parasitic Diseases of Poultry' (1896) mentions having seen specimens of two Menopons on numerous occasions in the nesting-boxes of chickens; (5) Desselberger (1933)[3] mentions in his account of the biology, etc., of the Mallophaga in Streseman's Aves, the occurrence of Mallophaga in the nests of birds. To these records I am able to add yet another: Mr. G. H. E. Hopkins collected numerous examples of *Heterodoxus longitarsus* (Piaget) (a kangaroo parasite which has become an almost cosmopolitan parasite of the dog, having been recorded from Australia, Africa (Belgian Congo, S. Africa), South, Central and North America), at Nakaru, Kenya Colony, 7.ii.1928, on some sacking upon which dogs were known to rest at intervals.

It is of interest to note that all the species of Mallophaga involved in the above records are members of the super-family Amblycera, which are definitely more active than the members of the super-family Ischnocera and are known to leave the bodies of their hosts after the death of the latter. These records also throw some light on a possible means of transference of the various species of lice from one host specimen to another. It is understandable that there are only few records of Mallophaga being found in situations apart from their hosts since they are extremely difficult to detect in an environment such as a bird's nest, but it is quite likely that they do often stray off their hosts on to the nesting material, especially during the period of incubation of the eggs, when the temperature of the nest reaches that of the body of its host.

I have made careful searches in the nests of numerous Martins (*Delichon u. urbica* L.) and Swallows (*Hirundo r. rustica* L.) which had only recently been vacated by the birds, but have never found any lice.

Since drawing up the above notes I have received through the kindness of Capt. W. W. A. Phillips three specimens of Mallophaga representing a species of the genus *Dennyus* which were collected from the nest of a Palm Swift (*Tachornis batassiensis batassiensis* (Gray)) at Mousakande, Gammaduwa, 16.x.1935, Ceylon. Capt. Phillips' notes regarding their capture are as follows: 'Lice among feathers, of which the nest is composed, in the edge of the nest. The nest contained one fresh egg and was on the underside of a palm-leaf of a tall coconut-palm.'

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[3] I am indebted to Herrn Wolfdietrich Eichler for this reference.

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Cromwell Road, London, S.W.7.
February 17th, 1936.

Dumfriesshire Hemiptera-Heteroptera.—Last year the continued bad weather, from mid-September onward, made field work for Hemiptera very unremunerative. The following species, however, were met with, along with others already reported. *Stygnocoris pedestris* Fall. is generally plentiful in the sweep net, and in moss in winter. *Scolopostethus decoratus* Hahn., common on heather and in the moss about its roots, particularly in autumn. *S. affinis* Schill., Browhouses, rare. *Tingis cardui* Linn., common here and there on thistles. I once saw several of the bugs attached to the seeds of the thistle being carried away by the wind. *Velia currens* Fab., abundant both on small streams and on pools on the moors. *Gerris lacustris* Linn., on a backwater of the R. Kirtle in July. *G. odontogaster* Zett. on pools on the peat mosses, one *G. costae* H. Schff. also occurring with it. *Acanthia scotica* Curt., on gravel beds on the R. Kirtle in June. *A. pallipes* Fab., on mud of river banks at Gretna and Browhouses. *Anthocoris confusus* Reut., common on various bushes, etc. *Tetraphleps vittata* Fieb. at Nutberry on Scotch fir and sometimes on larch. *Acompocoris pygmaeus* Fall. occurs similarly and much more plentifully. *Stenodema calcaratum* Fall. can be found almost anywhere and at any time. In my experience it is more abundant than *S. laevigatum* Linn. or *S. holsatum* Fab., although these are common enough. *Pithanus maerkeli* H.S., common. I was fortunate in meeting with a developed specimen on Newton Moss on July 1st. *Phytocoris tiliae* Fab., Nutberry Moss on oak, 6.ix.35, two only *P. ulmi* Linn. is always plentiful in summer along hedge banks, as is also *Calocoris bipunctatus* Fab. *Dichrooscytus rufipennis* Fall. occurred rarely in July by sweeping under fir trees at Nutberry. *Lygus pabulinus* Linn., common. *L. pastinacae* Fall., near Springfield in June, rare. *L. pratensis* Linn., common and variable in colour. I have found it in moss in April. *Bothynotus pilosus* Boh., one on Newton Moss, 6.vii.35, definitely from birch. *Dicyphus stachydis* Reut., locally common. I have taken it at Canonbie, Newton Moss, and Blackyett. *Cyllocoris histrionicus* Linn., fairly common on oak trees, and by sweeping on the moors. *Orthotylus ericetorum* Fall., abundant on heather on Newton Moss and elsewhere in autumn. *Phylus melanocephalus* Linn., not uncommon on oaks at Nutberry in July. *Psallus ambiguus* Fall., Newton Moss in July from some alder bushes. *P. alnicola* D. and S., also on alder and hardly rare.—Jas. Murray, 6 Burnside Road, Gretna, Dumfriesshire: *February 26th*, 1936.

SYSTEMATIC NOTES UPON BRITISH AQUATIC COLEOPTERA.

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INST

PART XII. GYRINIDAE.

(*AULONOGYRUS, GYRINUS, ORECTOCHILUS.*)

AULONOGYRUS.

Had the notes on this family been written before October, I should have described two British genera, *Gyrinus* and *Orectochilus*, but, in that month, Professor Heslop Harrison sent me one of seven specimens of *Aulonogyrus striatus* collected by his son on the Island of Raasay (Ebudes North). This is one of two extraordinary discoveries in the Western Islands of Scotland during the last autumn, the other being *Deronectes canariensis* Bedel, from the Island of Barra (Outer Hebrides).[1] Two specimens, a ♂ and ♀, of this latter species, previously known only from the Canary Islands, were sent me, collected by the same naturalist in October last.

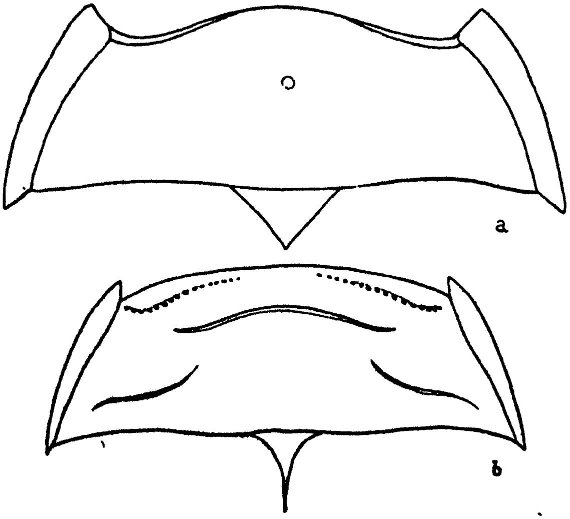

FIG. 29.—Prothorax of (a) *Aulonogyrus*, (b) *Gyrinus*.

Aulonogyrus striatus has previously only been found in the Mediterranean district and the Canaries. Thus both species are most extraordinary discoveries in the British Islands and suggest that a more careful survey of these western islands may reveal other southern species.

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[1] See Heslop Harrison, G., E.M.M. 1936, p. 52.

Aulonogyrus was first described by Régimbart (1883), who, however, referred it to an unpublished work of Motschulsky. The genus comes very near to *Gyrinus* and, as Régimbart himself says, differs only in very trifling characters. The most easily recognisable character is in the prothorax which, in *Aulonogyrus,* is without a fixed impression on the disc but punctured and finely rugose, whereas in *Gyrinus* it is marked more or less clearly by a median transverse furrow and by two lateral, somewhat S-shaped furrows (see fig. 29).

The penultimate visible abdominal tergum is strongly trilobed posteriorly in *Aulonogyrus,* whereas in *Gyrinus* this sclerite is at most very slightly sinuous, but is more usually square across the posterior margin.

As it appears that neither Régimbart nor any later author has fixed the type of this genus, I name *A. striatus* Fab.

The British list is, therefore:—

Aulonogyrus Régimbart, 1883.
striatus Fabricius, 1792.

Régimbart, in his Monograph on the Gyrinidae (1882, et seq.), divided the genus *Gyrinus* into two groups, the one possessing a small longitudinal ridge or keel on the mesoscutellum, the other having that part smooth. Of the first group, our *minutus* appears to be the only representative, spread over most of the northern hemisphere, although attempts have been made to break up the species. The second group Régimbart divided into two sections, in one of which the elytral striae are all visible, although the sutural ones may be weak, while in the other the sutural series, if visible at all, are merely unpunctured lines. All our British species belong to the former group, which is again divided upon the colour of the elytral epipleurs. The key covering the British species is as follows:—

Mesoscutellum possessing a small longitudinal keel ... *minutus*-group (1 species).
Mesoscutellum smooth.
(*a*) Elytral striae of distinct series of punctures, the sutural striae being usually finer.
(*b*) Epipleurs of elytra yellow, red, orange or brown .... *natator*-group (6 species).
(*bb*) Epipleurs metallic black, blue or purple ... *marinus*-group (3 species).

In 1907 Zaitzev made Régimbart's first group into a subgenus under the name *Gyrinulus,* leaving the rest of the species as *Gyrinus* s.str. In 1925 Melville Hatch took out a further subgenus, *Neogyrinus,* for certain American species. Thus only the first two subgenera concern the British list, but I have thought it unnecessary to adopt them and have used Régimbart's groups.

The genus *Gyrinus* is represented in the British Islands by ten species, but there has been, and apparently still is, considerable confusion as to the names of some of these. The commonest species is that known as *natator* Lin., which first appeared with a seven-word description in 1758 (p. 412). Fabricius (1775, p. 234) again described *natator* Lin., and as what looked like a synonym he mentioned *substriatus* Geoff. But reference to Geoffroy shows that there is nowhere any mention of such a name, and it appears that Fabricius only used the word as a short description and thus, presumably, indicated the type of elytral striation.

Stephens (1828) described *natator* Lin. as having 'very finely punctate-striate' elytra and another species 'or possibly a mere variety' of *natator, substriatus,* differing 'in the very obsolete striation of the elytra.'

Aubé (1838, p. 382-3) described *natator* Lin. 'elytres . . . lignes longitudinales de points enfoncés bronzés . . . les internes beaucoup moins senties que les externes'; Schaum (Erichson, 1868, p. 139) described a *natator* with weaker sutural striae on the elytra which he ascribed to Gyllenhal, Ahrens, Scopoli, Suffrian and Aubé, and of which he made *mergus* Ahr. a variety. In a footnote he explained that *natator* Lin. is a collective description of the Swedish Gyrinids and that therefore he passed it over.[2] But the description of most of the species of earlier authors is a collective description of all the species into which any of them has since been split up.

Sharp (1868, p. 56) recognised 'two well marked races' of *natator*: (1) *mergus* Ahrens, with 'the inner striae evidently finer than the outer, especially towards the suture, 'but always distinct and perceptible for their whole length,' and (2) *natator,* with 'the internal striae very obsolete or entirely wanting towards the base of the elytra,' and he states that *mergus* is the common form in the South of England, but does not occur at all in Scotland, while *natator* is abundant in Scotland but rare further south, and he says: 'I have it from Cambridge but not from the south of London. I have, however, a small series of specimens taken at Deal which agree closely with one another and possess the form of *G. natator* with the punctuation of *G. mergus.*'

Régimbart (1883, pp. 156-7) described *natator* Lin. and referred to the finer sutural striae in both the Latin and the French descriptions. Of this species he made a variety ‘ seriebus internis parum impressis, fere obsoletis,’ a description which agrees very well with that of Stephens for his *substriatus*.

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[2] See, however, Schaum's paper (1847, p. 278) where he states that, during a stay in London, he examined the Linne collection. Of *G. natator* he says, 'zwei Exemplare, beide zu *G. mergus* Ahr gehörig,' which seems to show that by 1868, he had forgotten about his visit to London.

Seidlitz (1886) described *natator* Ahr. (Ahrens having described it as of Linnaeus). Like Schaum, he considered that Linnaeus had not identified his species, but whereas Schaum had regarded Scopoli’s description ‘ pedibus et elytri margine externo rufi coloris ’ as definitely describing the species, Seidlitz regarded it as on the same plane with that of Linnaeus. But authors who have referred to Ahrens’ two species, *natator* Lin. and *mergus*, differ in their interpretations; some have described his *mergus* as being *natator* Lin. and his *natator* Lin. as being *substriatus* Steph. Others have made his *mergus* a variety of *natator*. Although Ahrens said of his *mergus* that the elytral striae are weaker towards the suture, Seidlitz (1886, p. 115) described it as having inner and outer striae almost equally strong and apparently confused it with *suffriani*, which he correctly described in 1872 and wrongly described after that. In 1886 and again in the second edition of the Fauna Baltica (1891, p. 105), he explained that, although Scriba had described his *suffriani* as having the inner striae as strong as the outer, he, Seidlitz, had seen one of Scriba’s types from Seligenstadt, and the inner striae were weaker than the outer. Consequently, he transferred his original description of *suffriani* to *mergus*. Since then, various authors have followed Seidlitz with regard to one or both of these species.

In view of the 1868 remarks of Sharp, already quoted, it is interesting to quote a passage from his 1914 paper (p. 132) where, referring to the elytral striae in *natator*, he says: ‘ There is some difference in the distinctness of the serial punctures near the scutellum, and the individuals in which the punctures are most distinct correspond, I believe, to the var. *mergus* of the older authors,’ and, after a further statement in which he finds it ‘ impossible to reconcile the statements of various authors ’ as to *mergus*, he adds: ‘ The remarks I made in 1868 as to the characters of “ *mergus* ” and “ *natator*,” as well as to their local variation, were based on an imperfect knowledge, and are to a large extent erroneous.’ This is an interesting recantation, but an examination of the material in the Sharp Collection in the Natural History Museum probably explains it. Under *mergus*, there are a number of specimens of different sizes and shapes, the common factor being the strong sutural striae. Only one of the Deal series remains, dated 25.ix.65, but it, and several specimens from Rhinefield (Hants, South) dated 11.v.09, and several other specimens of which I did not take particulars, agree with Sharp's description of the Deal series in that they 'possess the form of *G. natator* and the punctuation of *G. mergus*. After comparing Sharp's *mergus* with the types of Ahrens' species, lent me through the kindness of Dr. Rob. Schnetzer of the State Museum, Augsburg, there is no doubt but that his small specimens agree exactly with the true *mergus*.

In connection with the systematic work on this genus, especially because of the papers by Ochs (1927) and Omer-Cooper (1930 and 1931), I have had to go very carefully into the question of the identity of *natator* Lin. and various other forms, such as *mergus* Ahr., *wankowiczi* Rég., etc., and I have been able to do this through the kindness of a number of correspondents. In the first place, through the kindness of Mr. Day, of Carlisle, and Mr. Britten, of the Manchester Museum, I have been able to examine a number of specimens identified by Omer-Cooper as *natator* Ochs. Dr. Rob. Schnetzer, as already mentioned, sent me ♂ and ♀ types of *mergus* Ahr. and also two paratypes, and he also sent me a pair of types labelled '*mergus* var. *natator* Ahr.' Through the kindness of Dr. Lesne, of the Paris Museum, I have examined specimens of *wankowiczi* from the Régimbart collection, and I have examined the two Linnaean types in the collection of the Linnean Society of London. Further, Dr. K. G. Blair, of the British Museum (Natural History), enabled me to compare with the Linnaean types specimens of *natator* and *mergus* and *natator* var. *oblitus* from the Sharp collection and specimens of *natator* and *substriatus* from the Stephens collection.

From a first glance at the Linnaean types, their size and shape at once suggested them as the ordinary *natator* Brit. auctt., but they were so dirty that the elytral striae were invisible. With the kind permission of Dr. Calman, C.B., F.R.S., President of the Linnean Society, I cleaned the specimens sufficiently to enable me to see the striae, and it became evident at once that these specimens were not our common form. The striae, although weaker near the suture than farther out, are definitely stronger than in the common British form, and the two specimens seem to fit in exactly with Sharp's 1868 description of the small series of specimens from Deal, in that they possess the form of his *natator* and the punctuation of his *mergus*. An examination of Sharp's *natator* showed that it was our common form which British collectors and many others have been naming *natator* Lin., while of Sharp's *mergus* (of which, as already mentioned, the small specimens are *mergus* Ahr.)

the large specimens from Deal and Rhinefield exactly matched in punctuation, size and form the Linnaean types, of which it was not possible to determine the sex. One of Stephens' specimens of *natator* Lin., which I had for comparison, also matched the Linnaean types, while Stephens' *substriatus* is identical with the ordinary *natator* Brit. auctt. and with Ahrens' *mergus* var. *natator*. Sharp's var. *oblitus* has the striae slightly stronger than *mergus*, but it is far too close to *mergus* to be regarded as distinct.

A comparison of the Cumberland specimens of *natator* Ochs and Omer-Cooper with the Ahrens type of *mergus* showed that they are identical in striation, size and shape, and *wankowiczi* Rég. is undoubtedly the same form of the species. Therefore, the only difference between *natator* Lin. and *mergus*, *wankowiczi* and var. *oblitus*, lies in its shape and size, the two Linnaean specimens being definitely larger, and in these characters they are only matched by many of the numerous specimens I possess of our common *Gyrinus*, correctly identified by Ochs and Omer-Cooper as *substriatus* Stephens.

Now I cannot but believe that in 1868 a *natator* with stronger sutural striae was the common form, or at least a common form in Southern England and that, earlier still, it had been widely spread over the country. This *natator* may have been mostly *mergus*, but it also included the true *natator* Lin. which, judging by appearance, may be a cross between *mergus* and the now dominant British form, *substriatus*. *Mergus* is now rare, being confined to a few isolated spots, such as the two small peat bogs in Cumberland, one of which, I believe, has now dried up or been drained. Among my large collection of *Gyrinus* from all parts of the British Isles, I have only discovered one *mergus*, a male, taken by me in Co. Down, Ireland, in 1909.

Thus the change in Sharp's outlook appears to me to be due, not to his imperfect knowledge in 1868, but to a change in *natator* since that time.

G. natator is a variable species, and several varieties, other than those already mentioned, have been named. One of these, var. *schatzmayri* Ochs, was originally *corpulentus* Schatz., who named it in 1903, Régimbart having used the name in 1891 for an American species. Ochs, therefore, renamed this variety, characterised, according to Sharp (1914, p. 132), by a 'very fine strigation on the surface' and by Ochs as possessing 'a distinctly punctured surface.' Faint traces of punctuation of the surface can very frequently be seen in specimens of *substriatus*, and when these reach a certain degree of distinctness, dependent upon the observer, *substriatus* becomes *schatzmayri*. And since Ochs himself admits the probability that these markings are merely evidence of advancing age or are due to pathological causes or to habitat, intermediates are not only likely to occur but are probably as common as the named form. Omer-Cooper (1930, p. 74) named a variety *fowleri* on the strength of its being a 'somewhat deeper black' than *substriatus* and because it 'has the striae rather deeply and uniformly punctured, but in size and shape it appears to correspond to the var. *substriatus* . . .' He based this variety upon a single Scottish specimen, and it is to be noted that his description of it is identical with that of Sharp for his Deal series and is also identical with my description of the Linnaean types. So that this specimen appears to be the only example of the true *natator* Lin. that he has seen. Whether this form is as rare as it appears to be or whether it is passed over as *substriatus* remains to be seen, but I lean towards the view that this is either a cross, as already suggested, or a potential variation of both *substriatus* and *mergus* liable to occur as an habitat form or through some other stimulus. This view is based upon the fact that, so far as Sharp knew, *substriatus* did not occur in the south in 1868 and, so far as we know, *mergus* is now almost extinct in these islands. Although it is obviously intermediate in characters between *mergus* and *substriatus* and therefore joins the two, I think that we are justified in retaining the two as named varieties. I have paid no attention to Omer-Cooper's description of *fowleri* being 'somewhat deeper black' than *substriatus*. The colour tone of this latter varies from bright shining blue-black to dull black, and I feel that too much has been made of the colour question, both as regards the general surface and as to the shade of red on the elytral epipleurs and on the ventral sclerites. Age, habitat, method of killing, length of time in laurel, etc., all affect the colour tone, which I regard as quite valueless, except for hair-splitting purposes.

Gyrinus bicolor Fab. Schaum (Erichson, Ins. Deutsch. I, 2, p. 140) states definitely that, according to Fabricius' description of *G. bicolor* (Ent. Syst. I, 1792, p. 202-3), this species is not the same as that described by Paykull (1798, pp. 239, 240) under the same name, but he immediately adds that the possibility cannot be excluded that Paykull was correct in his interpretation of the Fabrician description: on this ground he proposed that the name *bicolor* should be retained but credited to Paykull, and Seidlitz (1886, p. 114) adopted the same view.

Under the rules of nomenclature, *bicolor* Paykull is inadmissible, since the name had already been used by Fabricius for a species in the genus, but it seems to me that the description by Paykull of the species which he says is *bicolor* Fab. is but little more definite than was that of Fabricius; as he states, however, that he is describing Fabricius' species and as his description is only six years later than that of Fabricius, I think that we are entitled to retain *bicolor* Fab. instead of burdening the literature with another name, as has been done by Ochs and accepted by Guignot, Omer-Cooper and others. If we are going to argue that, because a description is not sufficient to decide as to which of two or more species is intended, therefore we must reject the views of authors contemporary with or immediately following the original describer, who themselves declare that they are redescribing the species of the original author, we shall have to reject a large proportion of the names in our lists, and I suggest that steps should be taken to conserve the name *bicolor* Fab. for this elongate Gyrinid with the rounded apices of the elytra and the unmarked external apical elytral angle and in which the male has a fine pointed aedeagus.

The species *Gyrinus elongatus* Aubé in the British list, easily distinguished from *bicolor* by the truncated apices and distinct apical angle of the elytra, and the male by the broad and rounded apex of the aedeagus, requires a change of name, though there seems to have been some doubt as to which name is correct. According to Ahlwarth (1910), Zimmermann (1917, p. 156), Ochs (1927), Omer-Cooper (1930) and Guignot (1933, p. 1033), it is *caspius* of Ménétriés,[3] this name having three or four years priority over that of Aubé. On the other hand, Seidlitz (1886, pp. 114-5) identified *caspius* Rég. (who described *caspius* Mén.) with *distinctus* Aubé, but *elongatus* he regarded as *caspius* Suffrian and of Kiesw., although Ahlwarth makes this identical with Ménétriés' species. Schaum (1868, p. 161) suggested that *caspius* Mén. was identical with *distinctus* Aubé, of which he referred to the entirely shining interstrial elytral spaces.

Ménétriés' description of his species certainly fits what we know as *elongatus*, and therefore I think that we must accept the change to *caspius*.

With regard to *distinctus* Aubé, already mentioned, Aubé described it without any reference to fine punctuation between the elytral striae. Fairmaire and Laboulbène (1854, p. 221) also described *distinctus* and pointed out in a footnote that *colymbus* Er. resembles it but is distinguished by the very fine 'reticulation' on the interstrial spaces of the elytra. Régimbart (Second Suppl., 1892, p. 676), on the other hand, states that without exception every specimen of *distinctus* he had seen had this punctuation, and he explained this by saying that Aubé had not sufficient magnifying power to see the sculpture. It might be argued that since Aubé described the interstrial punctuation in *marinus* and *opacus,* he would have seen it in *distinctus,* had it been there, although, of course, it is finer in *colymbus*. But Aubé mentioned *colymbus* Er. as a possible synonym of *distinctus,* that is, he gave the synonymy with a question mark, and, assuming that he only compared specimens and did not read Erichson's description, it does suggest that he couldn't see the punctuation. However, so far as the name to be used is concerned, this does not matter. According to the dates in the respective works, it would appear that Aubé's work was published before that of Erichson, and Zimmermann (1917, p. 158) has a footnote in which he remarks: 'The name *distinctus* Aubé (Icon., 1836, p. 385) has priority of publication before the first 1837 appearance of *colymbus* Er. (Käf. d. Mark Brandbg., p. 191).

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[3] There seems to be some doubt as to the accent on the last 'e' of this name. In some cases it is printed without an accent, in others with a grave accent, but the one used above is correct.

Through the kindness of Mr. F. J. Griffin, Registrar of the Royal Entomological Society of London, who is an authority upon dates of publication, I have obtained some information as to the priority of publication of the descriptions of *distinctus* and *colymbus*. Erichson's book (Vol. I, pp. 1-384) was published before November 1st, 1837, so that the date of publication of *colymbus* (p. 191) is definitely 1837. On the other hand, Aubé (Dejean) only produced pp. 1-48 between October 1st and December 1st, 1836, and the last part of the volume appeared in 1838. As *distinctus* appears on p. 383 and there are only 409 pages in the volume, it is quite clear that the correct date of publication is 1838, since, in the absence of precise information, the latest date is to be considered the date of publication. Therefore *colymbus* Er. is the prior name for this species. Erichson's description of his species is very clear, but since that time we have, in addition to the fine punctuation character, the character of the aedeagus which, by its extreme width and rounded apex, at once separates this species from all the others in the British list. The figures of the aedeagi are given in Sharp's paper on British Gyrinids (1914).

Gyrinus suffriani Scriba is a distinct species but one whose characters suggest a relationship with *natator*. Omer-Cooper (1931,

p. 196) considered that it was linked to that species by an intermediate form which he found in var. *oblitus* Sharp. Presumably this means that he regards it as having originated from *natator*, whereas I should be content to believe that both have had a common origin and are evolving along parallel lines.

The range in this country is limited to south-east England, Lincoln South, Cambridge, Norfolk East, Kent East and Sussex East. One record by Lennon for Kirkcudbright in some MSS. notes he gave me is supported by a record by Sharp ((2) 1869-70, p. 134), where he mentions that he had captured single specimens at Dumfries, and he records it for Tweed and Solway districts in his list of the Coleoptera of Scotland (1873-4). In my experience this has always been an extreme rarity until last year, when I discovered in East Norfolk that it haunts swampy overgrown marsh drains and is usually the only species of *Gyrinus* in the dyke. Even having discovered its type of habitat, it was rare to catch more than one specimen at a time in the net, and I should imagine that a dozen specimens in an hour would be good collecting.

THE MARINUS-GROUP.

In the *marinus*-group there are three British species, although, up to 1914, only two were recognised, under the names *marinus* Gyll. and *opacus* Sahlb. Sharp (1914, p. 137) showed that the common species, easily confused with small specimens of *marinus*, which we had known as *opacus*, was not Sahlberg's species, and he pointed out that, seventy years previously, it had been erroneously identified by Suffrian under that name. It appears that it was first described by Thomson (1860) as *marinus* var. *aeneus*, but in 1907 Zaitzev, finding that this name was preoccupied, named it *thomsoni*. Sharp, having overlooked Zaitzev's paper, named it *edwardsi*, so that this name becomes a synonym, but until Sharp pointed out the very distinct aedeagal character there was not much to separate this species from small specimens of *marinus*. Seidlitz (1886, p. 117), in a footnote, pointed out that Thomson's *aeneus* was distinct from his *marinus* var. *opacus*, which is Sahlberg's species, and Régimbart (1891, Suppl. 2, p. 280), under *G. opacus* Sahlb., pointed out that all the examples he had seen from Sweden, Lapland and Finland were *marinus* Gyll., mostly of the smaller form, which was really *aeneus* Thoms. This was described by Thomson in 1860, and there is no doubt but that it is the species which Sharp discovered and named *edwardsi* in 1914 and which must therefore be known as *thomsoni* Zaitz.

In his 1868 paper on the British Gyrinidae (p. 59) Sharp had pointed out that the species we then knew as *opacus* had a variety in which the upper surface was altogether dull and opaque, and he mentioned that he had found it, in company with *G. minutus*, at Invercannich (Easterness). In his 1914 paper he shows that this is the real *opacus* Sahlberg. It appears to be very local in these Islands, since the only other specimens have come from Braemar (Aberdeen South) (Sharp) and from Harris (Outer Hebrides), where I found it in a number of pools high above sea-level in July, 1914.[4]

The type of the genus was fixed by Latreille (1810) as *natator* Fab. Fabricius (1775) himself gives a Linnaean reference in his synonymy. In 1808, Gyllenhal separated *marinus* from the original *natator*, and, among others, Erichson (1837, p. 191), Schaum (Erichson, 1868, p. 142), Gemminger and Harold (1868, p. 469), Ganglbauer (1892, p. 526), state that *natator* Fab. is a synonym of that species. Ahlwarth (1910, p. 20) has the same synonymy but he also makes *corpulentus* Schatz. a synonym of *marinus*, and there is no doubt but that the latter is a form of *natator* Linn. It is also to be noted that Gyllenhal (1808, p. 141) gives *natator* Fab. as a synonym of *natator* Linn. It appears that the Fabrician type is no longer in existence, but the Banks Collection in the British Museum (Natural History) contains a specimen of *natator* which is the true Linnaean form, and Fabricius is reputed to have overhauled that collection, which is evidence that *natator* Fab. is identical with the Linnaean species. Therefore *natator* Linn. may be regarded as the genotype, which is as it should be.

The British list is therefore:—

Gyrinus Geoffroy, 1762.
  (1) *minutus* Fabricius, 1798.

. . . . .

  (2) *natator*-group.
    urinator Illiger, 1807.

. . . . .

    natator Linnaeus, 1758 = *fowleri* Omer-Cooper, 1930.
      ,, var. *mergus* Ahrens, 1811 = *natator* Ochs, 1927, and Omer-Cooper, 1930 and 1931.
        = *oblitus* Sharp, 1914.
      ,, var. *substriatus* Stephens, 1828 = *natator* Ahrens, 1811 and Brit. auctt., = *schatzmayri* Ochs, 1927.

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[4] See my paper, 1915, p. 63.

suffriani Scriba, 1855.
bicolor Fabricius, 1787; Paykull, 1798 = *paykulli* Ochs, 1927.
caspius Ménétriés, 1832 = *elongatus* Aubé, 1838.
colymbus Erichson, 1837 = *distinctus* Aubé, 1838.

. . . . .

(3) *marinus*-group.
marinus Gyllenhal, 1808.
thomsoni Zaitzev, 1907 = var. *aeneus* Thomson, 1860 = *edwardsi* Sharp, 1914.
opacus Sahlberg, 1819.

Orectochilus was separated from *Gyrinus* in 1835 by Lacordaire. It is a large genus and has been divided into subgenera, of which our single species belongs to *Orectochilus* s.str. There is no dispute as to the name of the species, so that the British list is:—

Orectochilus Lacordaire, 1835.
villosus Müller, 1776.

This species was fixed as the genotype by Hope (1838).

This part completes the Notes upon the British Hydradephaga, except for the bibliography and a list of errata, which will appear in due course. A second volume on the Hydrophilidae is in preparation and, if the Editors approve, will be published in this Magazine.

CORRECTION.

In Part XI, in a footnote (p. 74), I referred to the orientation of the male genital armature and stated that Sharp and Muir (1912, pp. 491-2) had fallen into the common error of describing the left paramere as the right. I now find (p. 642) a correction, somewhat guarded, in the following words:—'If the position of fig. 39 (*Haliplus*) be considered correct as regards upper and lower aspects, then it is the right lateral lobe that is the broad one, not the left as stated in the text.' A printer's error, putting a fullstop after 'lobe' and giving a capital T to the next word, has been corrected in my copy by Dr. Sharp himself.

Hook Place, Burgess Hill, Sussex.
May, 1936.

Note on the Genus Arena Fauv. (Col. Staphylinidae).—Fauvel, characterising this genus (Ann. Soc. Ent. Fr. (4) II, 1862, p. 282) states 'tarses antérieurs de quatre articles, postérieurs de cinq,' and it appears to have been assumed by subsequent authors that the intermediate tarsi are 4-jointed, the genus being placed amongst the Bolitocharini. I find, however, that the intermediate tarsi are 5-jointed, which will necessitate its removal to the Myrmedoniini. The single representative of the genus appears to be as rare on the Continent as in this country.—M. CAMERON, 15 Teesdale Road, Leytonstone: *April 8th*, 1936.

RESULTS OF THE OXFORD UNIVERSITY EXPEDITION TO BORNEO, 1932.*

A NEW SPECIES OF *DIHAMMUS* THOMS. (COLEOPTERA, CERAMBYCIDAE).

BY DR. S. BREUNING.

Dihammus dentiferoides nov. sp.

Body elongate, narrow; antennae slender, nearly twice as long as the body (♀), the scape moderately long, narrow, with an incomplete cicatrix, the third joint about half as long again as the scape, distinctly longer than the fourth; the lower lobes of the eyes a little longer than broad, much longer than the mandibles; front rectangular, higher than broad, finely punctured, as is the vertex. Pronotum transverse, furnished at the middle of each side with a moderately long tubercle, disc finely punctured; scutellum rather long, rounded at apex; elytra elongate, subparallel, rounded at apices, closely, moderately strongly punctured, the punctures very fine towards the apex, arranged more or less in longitudinal rows on the basal half; prosternal and mesosternal processes narrow.

Colour reddish-brown, entirely covered with an olivaceous-grey pubescence; the apical half of the antennal joints, beginning with the third, fuscous.

Long. 12 mm., lat. 3.5 mm.

Type, 1 ♀ from Borneo, Sarawak, Mt. Dulit, 1,650 m., moss forest, 19.x.1932 (*Messrs B. M. Hobby and A. W. Moore*). Type in British Museum (Nat. Hist.).

Closely allied to *D. dentifer* Aur. from Mindanao, but in this species the third joint of the antenna is twice as long as the scape, the lateral tooth of the pronotum is distinctly longer, the elytra are slightly truncate at apex, finely granulate at base, the punctures are not arranged in longitudinal lines; the scutellum is clothed with a dense ochraceous-yellow pubescence, contrasting strongly with the general colour of the insect; the antennae are covered with the same olivaceous-grey pubescence as the whole surface.

18 Prinz-Eugenstrasse, Vienna, IV.
January 22nd, 1936.

ON A COLLECTION OF HUMBLE-BEES (*BOMBUS* AND *PSITHYRUS*, HYMENOPTERA) FROM CARA ISLAND, ARGYLLSHIRE.

BY O. W. RICHARDS, M.A., D.SC., F.R.E.S.

Through the kindness of Dr. B. M. Hobby, I have been able to study a collection of Humble-bees made in 1935 on Cara Island, Argyllshire (about 54° N., 5¾° W.) by Mr. G. Swynnerton. The island is a small isolated one lying just off Gigha. It rises to a height of 185 feet and is quite treeless.

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* For a general account of this expedition see T. H. Harrisson, 1933, Geographical Journal, 82 : 385-410.

Bombus Latreille.

B. lucorum (L.), 2 ♀♀ 1.vii, 3 ♀♀ 8.vii, 1 ♀ 9.vii; *B. jonellus* (Kby.), 2 ♀♀ 8.vii, fairly normal specimens of the typical form; *B. lapidarius* (L.), 1 ♀ 9.vii; *B. soroensis* (Fab.), 2 ♀♀ 2.vii; *B. hortorum* (L.), 2 ☿☿, 2.vii and 11.vii; *B. muscorum pallidus* Evans 1 ♀ 1.vii, 1 ☿ 2.vii, 2 ☿☿ 8.vii; *B. agrorum septentrionalis* Vogt, 1 ♀ 2 ☿☿ 2.vii, 6 ☿☿ 8.vii.

Psithyrus Lep.

Ps. campestris (Pz.) var. **swynnertoni** var.n.

♀. The hairs are black; half the hairs of the vertical tuft yellow, half black; mesonotum, except for a slight intermixture on disc, and mesopleuron ochreous; tergite 1 ochreous, black mixed at sides; 2 black with small lateral tufts on the apical quarter bright yellow; 3 with large lateral yellow tufts covering the whole length of the tergite at the sides; 4 mainly yellow, with a large baso-discal black lunule: 5 even more yellow, basal lunule smaller; venter with long pale hairs; legs black haired; wings rather dark; hairs a little longer than in specimens from S. England. Length 19 mm.

♂. The hairs are black; those of the tuft on vertex yellow; mesonotum yellow with an indeterminate black discal patch; mesopleuron yellow; hairs of abdomen yellow, disc of tergite 6 and most of tergite 7 black haired, sternite 6 with long lateral tufts largely black; legs black haired, considerably intermixed with pale hairs beneath the mid and hind femora; wings nearly hyaline; hairs a little longer and denser than in S. English specimens. L. 19 m.

Type ♀, Cara Island, 9.vii (Dept. of Entomology, Oxford Univ. Museum); allotype ♂, Loch Sween, Argyllshire, 25.viii.20 (Perkins coll., Oxford Univ. Museum); paratypes 4 ♀♀, Cara Is., 8.vii. 35 (three in Oxford Univ. Museum, two in my collection), 1 ♀, 'Scotland' (British Museum), 1 ♀, 2 ♂♂, Loch Sween, viii.20 (Perkins coll., Oxford Univ. Museum).

The British Museum female has rather fewer yellow hairs on abdominal tergites 1 and 2.

Mr. F. Allen (Map Curator at the Royal Geographical Society) kindly informs me that Loch Sween is in Argyllshire, the head of the loch being at 56° 2′ N. and 5° 35′ W. (*i.e.* very near Cara Island).

Females of *Psithyrus campestris* with as many or nearly as many yellow hairs turn up occasionally in various parts of Europe. They appear to be very rare, or at least to form only an insignificant part of the whole population; as a rule they have not been described in any detail.

The present form is apparently the only type of the species where it occurs and will probably be found to be a geographical race associating with the pale form *septentrionalis* Vogt of *B. agrorum* (Fab.). Apparently, however, the *Psithyrus* has a much less extensive range than its supposed host. Dr. R. C. L. Perkins, F.R.S., has already mentioned and briefly described the Loch Sween specimens (1921, Ent. Mon. Mag., **57**: 82-83) without giving them a name.

There is still need for more data as to the distribution of *Ps. campestris* (Pz.) in Scotland. Mr. K. J. Morton, of Edinburgh, has very kindly sent me information as to all the records he has knowledge of, and Mr. A. R. Waterston informs me that there are no Scottish specimens in the Royal Scottish Museum (specimens in the Cameron collection purporting to belong to this species were *Ps. sylvestris* Lep. with one *Ps. bohemicus* (Seidl)).

Scottish records:—(1) In the Evans coll. (examined by Mr. Morton), 1 ♂, Loch Sween (Morton), 1 ♂, Dumfries (Service), both apparently of the var. *swynnertoni*. (2) In coll. Morton, a series of males and a few females, Loch Sween. (3) Moray (det. F. Smith) (Gordon, 1887, Scottish Nat.: 178). (4) St. Fillans, Mid Perth (det. E. Saunders) (Rothney, 1906, Ent. Mon. Mag., **42**: 14). The specimens on which the last two records were based are not available for study. According to Mr. Morton, the species does not occur in the Forth drainage area. The most northerly English record is from Carlisle (Routledge, 1933, Trans. Carlisle Nat. Hist. Soc., **5**: 99).

29A Edith Road, London, W.14.
March 31st, 1936.

STRONGYLOGNATHUS DIVERI SP.N. (HYM. FORMICIDAE), A GENUS AND SPECIES NEW TO THE BRITISH LIST, WITH NOTES ON THE GENUS.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

(Department of Entomology, British Museum (Natural History).)

Strongylognathus Mayr, Verh. zool.-bot. Ver. Wien **3**, p. 389 (1853) (1) (στρογγύλος, cylindrical; γνάθος, mandible).

Subfamily: Myrmicinae. Tribe: Tetramoriini. Type: *Eciton testaceum* Schenck.

☿. ***Head*** rectangular, more or less emarginate at base; clypeus triangular, straight at sides, rounded posteriorly, convex or a little concave in middle, extending between the insertions of the antennae; *antennae* articulated close to the anterior border of the head; *frontal carinae* medium, sharply bordered at sides; no *scrobe* present; *frontal area* small, often indistinct; *mandibles* narrow, cylindrical, sickle-shaped, pointed, without a toothed masticatory border; *labial palpi* 3-jointed, first joint long, slender, second joint short, broader, third joint fusiform; *maxillary palpi* 4-jointed, first joint cylindrical, second and third joints shorter, fourth joint fusiform; *labrum* subquadrate, twice as broad as long, bilobed at apex forming two semicircles; *antennae* 12-jointed; *scape* not reaching the posterior border of the head; first joint of *funiculus*

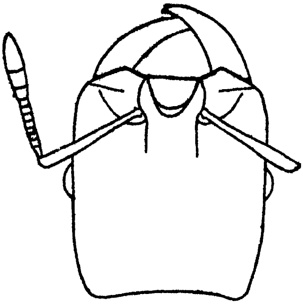

Fig. 1

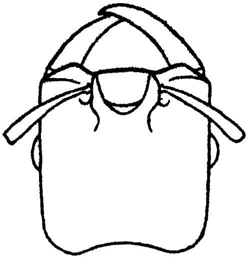

Fig 3

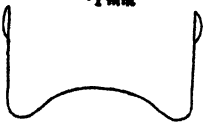

Fig. 2

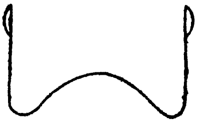

Fig. 4

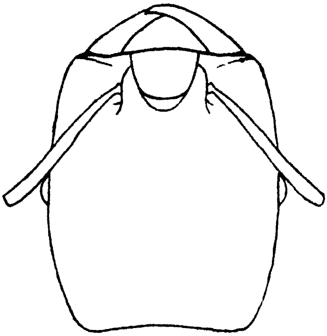

Fig 5

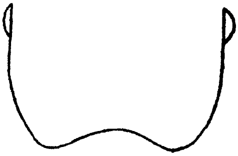

Fig 6

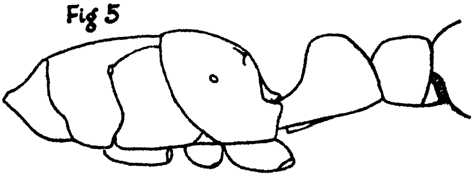

Fig. 7

1. Dorsal view of head of *Strongylognathus diveri.*
2. View of posterior margin of head of *S. diveri,* head tilted forward so that the emargination extends to its maximum apparent depth.
3. Dorsal view of head of *S. testaceus.*
4. Posterior margin of head of *S. testaceus.*
5. Dorsal view of head of *S. huberi* subsp. *foreli.*
6. Posterior margin of head of *S. huberi* subsp. *foreli.*
7. Lateral view of thorax of *S. diveri.*

longer than the second, the following joints short to the 3-jointed club, the last joint of which is longer than the two preceding taken together; *eyes* moderate, slightly prominent, situated in the middle of the sides of the head. *Thorax*: no suture above between pro- and mesonotum, suture between meso- and epinotum well defined; *epinotum* armed with two teeth, which are sometimes very minute or missing; *petiole* pedunculate, nodiform posteriorly; *post-petiole* nodiform, broader but lower than petiole; *gaster* short, oval, first segment occupying three-fourths of gaster. *Legs* fairly long; *posterior tibiae* with finely pectinate spurs.

♀. A little larger than ☿; *head* and *pedicel* as in ☿; *mesonotum* not very prominent, not covering all the pronotum; *epinotum* with two teeth. Wings: one *discoidal cell* and one *cubital* cell present, *radial* cell open.

♂. *Mandibles* pointed; *palpi* as in ☿ and ♀; *antennae* 10-jointed; *scape* shorter than funiculus; *funiculus*, first joint small, scarcely longer than broad, second joint long, as long as the three following taken together; *Mayrian furrows* present; *epinotum* with two teeth, sometimes wanting; *size* and *wings* as in ♀.

Strongylognathus diveri sp.n.

☿. Reddish-testaceous, head and base of first segment of gaster slightly darker, legs paler; eyes black; whole body furnished with scattered bristle-like hairs. *Head* quadrate, sides parallel, posterior border emarginate, posterior angles bluntly pointed and projecting, anterior margin projecting in a blunt point in front of the antennal cavities; *front* and *cheeks* longitudinally striate; *clypeus* convex, smooth, shining, anterior border straight, posterior border rounded; *frontal area* somewhat indistinct, finely longitudinally striate; *frontal carinae* bluntly pointed anteriorly, bordered with a sharp raised ridge continuing round the antennal cavity; *antennal cavity* concentrically striate; *mandibles* long, pointed, smooth, except at apex, the latter faintly sculptured; *eyes* moderate, not composed of many facets; *antennae* long; *scape* slender and curved at base, clavate towards apex, when bent back not reaching posterior border of head by about one-third of the length of the same; *funiculus* pubescent, longer than scape, long, with a long 3-jointed club; first joint of *club* shorter and narrower than second, last joint pointed, long, longer than the two preceding taken together. *Thorax* slightly longer than head, broadest a little before apex, considerably narrower than head, distinctly longitudinally striate except in centre; *pronotum* rounded in front, *anterior angles* rounded, no trace of suture between pronotum and mesonotum above, but marked by a furrow at sides; *suture* between mesonotum and epinotum marked by a depression, continued at sides; *episternite* of *mesothorax* rather distinctly defined and somewhat strongly striate longitudinally; *epinotum* somewhat convex above, the dorsal surface, when viewed from the side, bordered at sides by a margin, or ridge, continued from the base of the mesonotum to the small tooth with which the epinotum is furnished, separating it from the lateral surface, the declivity transversely striate. *Petiole* pedunculate, the posterior portion furnished with a *node* which is higher than the post-petiole; *peduncle* beneath with a slight, narrow, projecting ridge at base; *post-petiole* transverse, broader than petiole, rounded at sides and in front, almost straight posteriorly; *gaster* moderate, smooth. *Legs* long, *femora* spindle-shaped. *Long.* 2.7—3 mm. (with mandibles), 2.5—2.8 mm. (without mandibles).

Type in B.M. Coll.

Described from three workers taken by Captain C. Diver (2) near Studland, Dorsetshire, in company with workers of *Tetramorium caespitum* L.

S. diveri comes nearest to *S. testaceus* Schenk, from which it differs in that it is larger, darker in colour, and considerably more strongly sculptured; the head is longer, and the club of the antennae is slightly longer and narrower, especially the last joint. The eyes are slightly larger and more prominent, the head is less emarginate posteriorly and the posterior angles slightly less prominent. The mesothoracic episternite is considerably more defined; and the margin or ridge, which divides the dorsal from the lateral surface of the thorax, is not noticeable in *S. testaceus*. (This latter character is present in *S. destefanii* Emery and *S. huberi* For.). The teeth to the epinotum are more distinct, those of *S. testaceus* being very minute. It is unnecessary to compare *S. diveri* with any of the other species and subspecies, as it and *S. testaceus*, are the only two species at present known in which the anterior margin of the head projects at the sides in front of the antennal foveae. The posterior border of the head is also considerably more emarginate.

The genus *Strongylognathus* is confined to the Palaearctic Region, species being found in Europe, West Siberia, Asia Minor and the southern shores of the Mediterranean.

Seven species are known (including *S. diveri*), six subspecies and three varieties. These are:—

1. *Strongylognathus afer* Emery	Algiers, Tunis.
subsp. *caeciliae* Forel	Spain.
2. *S. destefanii* Emery	Sicily.
3. *S. emeryi* Menozzi	Calabria.
4. *S. huberi* Forel	Fully (Switzerland).
var. *christophi* Emery	South Russia.
var. *gallica* Emery	South France.
subsp. *alpina* Wheeler	Zermatt.
subsp. *cecconii* Emery	Tremiti Island (Adriatic).
subsp. *foreli* Emery	Algiers.
subsp. *rhebinderi* Forel	Caucasus.
var. *bulgarica* Viehmeyer	Bulgaria.
subsp. *russkyi* Emery	Urals.
5. *S. kervillei* Santschi	Angora.
6. *S. testaceus* Schenck	Central Europe, Caucasus.
7. *S. diveri* sp. n.	England.

All the species of *Strongylognathus* are of a darker or lighter yellow colour and live only in the nests of the ant *Tetramorium caespitum* L., its subspecies and varieties. They are called degenerate slave-makers, for, though they all possess falcate mandibles as in the true slave-makers (ants of the genus *Polyergus*), they appear to have more or less given up making spontaneous slave-raids, the habit becoming vestigial. Forel (3) has shown that if strange *Tetramorium* workers and pupae be placed near a *S. huberi* and *T. caespitum* colony, the *Strongylognathus* workers will go forth in a closed phalanx, pierce the heads of the strange *Tetramorium* workers and carry in their pupae. Nevertheless, their own *Tetramorium* will afterwards carry out the strange pupae and throw them away. It must be admitted, however, that *S. rhehinderi* has been found (4) in such circumstances that point to the fact that a slave-raid was taking place, and Kutter (5) has shown that *S. alpina* does make slave-raids. Also *Strongylognathus* species occur with some of the fiercer races of *Tetramorium* — in Sicily I found *S. destefanii*, of which only the female was known until then, in some numbers in nests of *T. ferox* Ruzsky (6).

The workers of *S. huberi* are often present in very considerable numbers; whereas those of *S. testaceus* are very much reduced, and it appears as if they may eventually disappear altogether, leaving only males and females, as is the case with *Anergates atratulus* Schenck, an ant which also lives only in the nests of *Tetramorium caespitum*, and was discovered by Crawley and myself in the New Forest in 1912 (7).

Wasmann (8), who found an immense mixed colony of *T. caespitum* and *S. testaceus* in Bohemia, suggested that the colony was jointly founded by the alliance of a *Strongylognathus* queen with a *Tetramorium* queen, but Wheeler (9) is of the opinion that the former enters the latter's nest after it has already been established and become populous.

It only remains for me to thank Dr. O. W. Richards for the drawings illustrating this note and to congratulate Captain Diver on his most interesting discovery. It is to be hoped that this year we shall be able to obtain further information on the habits of this new ant.

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British Museum (Natural History),
Cromwell Road, London, S.W.7.
March 22nd, 1936.

THE PARASITES OF BRITISH BIRDS AND MAMMALS.

VII. RECORDS OF IXODOIDEA FROM HEDGEHOGS AND THEIR NESTS.

BY GORDON B. THOMPSON
(Department of Entomology, British Museum (Nat. Hist.).)

In connection with the parasitological surveys of British mammals which are being carried out by the Bureau of Animal Population at Oxford, I have received through the kindness of Messrs. C. Elton and D. H. S. Davis some material collected off hedgehogs and from their nests.

Thirteen hedgehogs and nests have been examined, and of these five yielded no ticks at all and two of the records have already been published (Thompson, 1935). The following table gives the results of examining five hedgehogs and nests. The remaining record is dealt with separately immediately after the table.

Host.	Locality.	Species of Ixodoidea.	No. of specimens.
Erinaceus europaeus Linn. (Hedgehog) (H.7).	Oxon., N. Oxford Golf Course, 30.x.1934.	*Ixodes hexagonus* Leach.	1 male.
E. europaeus Linn. (H.9).	Oxon., Witney, 14.xii.1934. (In empty nest.)	*I. hexagonus* Leach.	1 nymph.
E. europaeus Linn. (H.11).	Oxon., Witney, 16.xii.1934. (Hog dead in nest.)	*I. hexagonus* Leach.	1 male, 1 female, 5 nymphs.
E. europaeus Linn. (H.13).	Oxon., N. Oxford Golf Course, 7.ii.1935. (Hog dead in nest but no ticks on it.)	*I. hexagonus* Leach.	3 nymphs.
E. europaeus Linn. (H.12).	Oxon., Witney, 27.i.1935. (Hog dead in nest.)	*I. hexagonus* Leach. *I. ricinus* Linn.	4 nymphs. 1 male.

The particular nest from which material of exceptional interest was obtained was situated in a small copse at the edge of a pasture field in a garden at Witney, Oxon., and was examined on December 14th, 1934, by Mr. H. V. Chorley. It was a large nest measuring roughly three feet by two feet and had contained during the previous summer a family of four young. At the time of collecting the material the nest was deserted. A total of 798 specimens of *I. hexagonus* Leach were collected, and the following are the numbers of each form taken :—

19 replete females } = 31 females
12 unfed females }
41 males = 41 males
233 replete nymphs } = 314 nymphs
81 unfed nymphs }
412 replete larvae = 412 larvae

Total = 798

During the last week of December, 1934, and the first fortnight or so of January, 1935, the females deposited large numbers of eggs. During February, 1935, the few larvae and nymphs cast their skins. Of the nymphs which survived, eighty-nine became females and eighty-six became males. In the latter part of March, 1935, Mr. D. H. S. Davis wrote, saying that a stock of *I. hexagonus* Leach consisting of unfed females, males, unfed nymphs and eggs was being kept alive at the Bureau from the original collection from the nest.

The rarity of the males of *I. hexagonus* Leach may be gathered from the following statement by Nuttall (1911, p. 345) : '. . . we have recently (March, 1911) discovered a male of *I. hexagonus* Leach in the nest of a hedgehog. This is the first male we have captured, whereas we possess hundreds of females, nymphs and larvae from various hosts.' In view of this the occurrence of so many males in a single nest is of great interest, and it is evident from the records that the males should be sought for in the nests of their hosts. Unlike *I. ricinus* Linn., *I. hexagonus* Leach apparently never copulates on the host's body. Although *I. hexagonus* Leach has been recorded from a large variety of hosts, the hedgehog seems to be much favoured (Thompson, 1935). The occurrence of a single male of *I. ricinus* Linn. in one of the hedgehogs' nests examined is of interest, as it appears to have only been recorded from this host by MacLeod (1932).

I wish to record my thanks to Dr. S. Finnegan for her kindness in giving me access to the literature on the Ixodoidea.

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British Museum (Natural History),
London, S.W.7.
February 20th, 1936.

A new British Sawfly (Hymenoptera Symphyta).—A short time ago, when looking over some sawflies collected by my friend Mr. H. W. Daltry, I found several specimens which puzzled me so I submitted them to Mr. R. B. Benson for his determination. One specimen in particular interested him, which he eventually determined as ***Pristiphora* (*Lygaeonematus*) *albilabris*** C. G. Thomson, ♀. Mr. Benson informs me that it agrees exactly with specimens in the recently acquired Stein Collection from Central Europe, now at South Kensington, and is an interesting addition to the British Fauna. The species is closest to ***P. carinatus*** Hartig, the high-mountain species taken at Braemar, Aberdeenshire, 27.v.1931, by Mr. P. Harwood, and belongs to the *coactulus* (Ruthe) group. The specimen was taken by Mr. Daltry at the Burnt Woods, Staffordshire, 31.v.34. I am pleased to say Mr. Daltry is sending it to add to the British collection in the Natural History Museum.—J. W. Saunt, 119 Bull's Head Lane, Coventry: *March 12th,* 1936.

Additional records of Nematinus nigrosternatus Mal.—In the E.M.M., Vol. LXXI, p. 239 (November, 1935) Mr. Benson added the above-named species to the British list; prior to this I had a ♀ *Nematinus* which ran down to *N. acuminatus* Thoms. in the keys then available. However, I find it agrees with Mr. Benson's description of *N. nigrosternatus* Mal. The specimen was taken by Mr. Daltry at Burnt Woods, Staffs., 2.vii.1932, and kindly given to me to add to my collection. When collecting at Bubbenhall, Warwickshire, 15.vi.35, I took a ♀ *N. nigrosternatus* Mal. which has the middle lobe of the mesonotum clear, and the side lobes marked with black, the metanotum being pale.—J. W. Saunt: *March 12th,* 1936.

Sminthurides schotti Axels. (Collembola) in Oxfordshire.—This minute species of Springtail (male .25 mm., female .4 mm. in length), occurred in considerable numbers in a collection of Collembola sent me for determination by Mr. J. Ford (New College, Oxford). They were obtained during a soil investigation, and were collected in the soil from a meadow at Headington Wick, near Oxford. The insects were very plentiful in both sexes, and Mr. Ford tells me that they seem to prefer an exposed habitat, the soil being very poor and only sparsely covered, while they were much less plentiful in adjacent areas well covered with plants.

This is, I believe, only the third British record for this species, the two previous ones being: Weardale, Durham, from *Sphagnum* (R. S. Bagnall, as var. *bilineata* Axels., 'Vasculum,' 1921, p. 14); Myrfaen, N. Wales, in soil under moss (W. M. Davies, 'E.M.M.,' 1934, p. 93).—James M. Brown, 176 Carter Knowle Road, Sheffield: *April 7th,* 1936.

Reviews.

'**SOUTH AFRICAN BUTTERFLIES.**' A Monograph of the Family Lycaenidae. With a description and illustration of every species and figures of many of the larvae—edited and drawn by DESMOND P. MURRAY, Friar of the Order of St. Dominic; formerly Hon. Curator in Entomology, Witwatersrand University, Johannesberg, S. Africa. 8vo, pp. viii, 195, plates 18 (12 in colour). London: John Bale, Sons and Danielsson, Ltd., 83-91 Great Titchfield Street, W.1. Price 25/-. 1935.

The object of this handsomely produced volume, as stated by its author, is to supplement and to bring up to date the second volume of the late Roland Trimen's great work, 'South African Butterflies,' now out of print and scarce, as well as to supply accurate coloured figures of practically all the species of Lycaenid butterflies known to exist in the region comprised under the general designation of South Africa. This region includes all the country (with the exception of the former German territory of South-West Africa) south of a line drawn from Walfish Bay on the west coast to the mouth of the Limpopo River on the north-east, nearly half a million square miles in extent; and from this area about 150 distinct species of the Family Lycaenidae have been recorded up to the present. These butterflies, many of them of extreme beauty and singularity of form, are described in full detail in the work now under notice, and all but a very few of them are depicted on the twelve plates in colour, excellently reproduced from the author's original drawings; the figures, on an enlarged scale, of the delicately marked undersides of the species of *Lycaena*, being specially worthy of commendation. Even more interesting and valuable are the details of the early stages of many species, fully dealt with in the text and illustrated by five additional half-tone plates, with another showing the wing-venation of the respective genera. The introductory text (pp. 1—38) is adequate and well-written, special attention being drawn to the lamentably destructive effects of 'the insane custom of veld-burning,' on the indigenous fauna and flora. We imagine, however, that the strictures of the author on such subjects as Mimicry and Evolution in general will find but little favour with the majority of modern workers in entomological science. A useful list of food-plants concludes this excellent work, which we heartily commend to the notice of entomologists in general, as well as to specialists in exotic butterflies and their bionomics.

'**A CONTRIBUTION TO A BIBLIOGRAPHY OF THE DESCRIBED IMMATURE STAGES OF NORTH AMERICAN COLEOPTERA.**' By J. S. WADE, Cereal and Forage Insect Investigations, Bureau of Entomology and Plant Quarantine, United States Department of Agriculture, Washington, D.C. September, 1935.

This 'mimeographed' brochure embodies references in full to all the available literature dealing with the preparatory stages of at least 1,200 species of North American Coleoptera (arranged in the alphabetical order of the generic and specific names) from the date of publication of Beutenmuller's 'Bibliographic Catalogue of the Described Transformations of the North American Coleoptera' in 1891, up to the present time. When the many points of close affinity between the insect faunas of Europe and North America are considered, this monumental work of patient research and arrangement, with which its compiler has been occupied for several years past, cannot fail to be nearly if not fully as interesting and valuable to our own Coleopterists as to those of the continent with which it is more immediately concerned.

Obituary.

Mr. A. H. Ritchie.—It is with sorrow that we have to record the sudden death at Moshi on February 20th of Archibald Hamilton Ritchie, Government Entomologist for Tanganyika Territory. Though not generally known to our readers, he was familiar to a wide circle of professional entomologists. Born at Denny, Stirlingshire, in 1887, Mr. Ritchie was trained at Glasgow University, where he had a distinguished career in both zoology and botany, winning medals in the former subject in 1908 and 1911, and in the latter in 1910. Unfortunately a very serious illness prevented him from completing his degree. On recovery he taught for a short time at a school in his native town, and then in the autumn of 1912 he matriculated at Edinburgh University, where he studied entomology under Dr. R. Stewart MacDougall. On obtaining a Carnegie Scholarship late in 1913, Mr. Ritchie proceeded to America where he spent a year at Cornell University, and later travelled through many of the southern states where he made himself familiar with the practical side of the entomological problems affecting those areas. In 1915 he was appointed Government Entomologist for Jamaica, and soon after his arrival in Kingston took an important part in the introduction of systematic dipping of cattle, basing his methods on what he had observed in Texas. Active investigations into the insects affecting such crops as sugar-cane, pine-apple, banana, and citrus were carried on contemporaneously with much general collecting. For a short period Mr. Ritchie left the colonial entomological service to engage in sugar-planting in Jamaica, but in 1921 he returned to it on his appointment to Tanganyika Territory. There he entered wholeheartedly into the life of the colony, both professionally and socially. Of necessity he had to specialise in the insects affecting the two main crops, cotton and coffee, but in the last few years he devoted most of his time to the latter, though he found time to foster bee-keeping and sericiculture. During his last tour of duty he was engaged in investigating the life-history of *Leucoptera coffeella* and had established the fact that two species were involved; the second one has recently received a MS. name from Mr. Meyrick. Many interesting observations on the coffee-borers and their wild hosts were also made by him Mr. Ritchie was, however, first and foremost an 'economic entomologist' in the strict sense, for he regarded as part of his duty the necessity of knowing every detail of the prices of chemicals and insecticides, the cost of application, the benefit of treatment accruing to the planter, the 'points' of spraying machinery, the ease with which spare parts could be obtained and its general suitability for colonial conditions. More than one British manufacturer, we know, feels that he owes something to Mr. Ritchie's experience, so ungrudgingly given when home on leave, and perhaps also so hesitantly accepted. He knew what he wanted and what he would recommend to the planters' associations and in the end he was usually successful in getting his way. His travelling laboratory, mounted on a motor chassis, was one of the best we have seen designed, and proved a boon to a scattered population in a comparatively new country. He was an assiduous field-naturalist, and enriched, through the Imperial Institute of Entomology, the National Collection with long series of many highly desirable species. The care with which his material was preserved was something to admire and praise, and the writer wishes to place on record the pleasure (a pleasure shared with other specialists) he always had in examining and reporting on specimens belonging to those families in which he was particularly interested. A hard worker possessing a wealth of knowledge and experience, a high-minded public servant, a good friend, Mr. Ritchie was a credit to the colonial service which will be all the poorer by his death.—F. Laing.

SYSTEMATIC NOTES UPON BRITISH AQUATIC COLEOPTERA

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CORRECTIONS.

Part I, June 1934.

p. 128, line 7 from bottom, for 'Aubé 1837' read 'Aubé 1838.'
„ „ „ „ „ „ 'Heer 1841' read 'Heer 1839.'
p. 129, line 7, for '1785' read '1795.'

Part II, July 1934.

p. 147, second para. for 'Zimmermann (1917, 1919) read ((1917) 1919) the same dating should follow '*Stictotarsus*' and '*Potamonectes*.'

Part III, Aug. 1934.

p. 176, fig. 5. The right half should be 'a,' and the left half 'b.'
p. 177, 12th line, delete 'readily.'

Part IV, Sept. 1934.

- p. 196. Replace footnote thus:—'The Proventriculus in the Dytiscidae (Col.) as a Taxonomic Character' Stylops III, 1934, pp. 241-244; IV, 1935, p. 191.
- p. 197, line 7, for (1930) read (1830).
- For genotype of *Oreodytes* see Addendum to Part X, April 1936, p. 77.

Part V (1), Oct. 1934.

- p. 225, lines 15-17, read '*Laccornis* Des Gozis (subg. 1914, p. 146) raised to generic rank under the name *Agaporus* Zimm. ((1917) 1919) p. 160 and retained as genus by Guignot 1933.'
- p. 227, line 10, for (1917-19) read ((1917) 1919).
- p. 228, footnote, replace by the same correction as for Part IV, p. 196.

Part V (2), Nov. 1934.

- p. 254, line 11 from bottom, read '*memnonius* Nicolai 1822' instead of '1832.'
- p. 255, line 1, 'Zimmermann 1917-19' should read '((1917) 1919)).'

Part VI, Jan. 1935.

- p. 9, second para., 6th line. For 'metastern' read 'metasternum.'
- p. 11, line 9, for 'Fowler (1888)' read (1887).
- p. 12, line 10. For 'with' read 'from.'
- p. 13, line 23, *chalconatus* Panzer (1796) should read (1794).

Part VII, Sept. 1935.

- p. 195, seven lines from bottom, read 1767 instead of 1766.
- p. 198, first line, for 'Thompson' read 'Thomson.'
- p. 199, line 12 from bottom, '*Ilybius* Erichson (1932)' should read (1832). Line 4 from bottom, '*fenestratus* Fabricius (1871)' should be (1781).

Part VIII, Oct. 1935.

- p. 225, line 3 from bottom, for '*graphii*' read '*grapii*.'
- p. 226, para. 5, last line, for 'behind' read 'in front of.' Explanation of figure, for '*pulverosus*' read '*bistriatus*.'

Part IX, Nov. 1935.

- p. 247, 12 lines from bottom, for 'Erichson (1839)' read (1837).

Hook Place, Burgess Hill, Sussex.
May 19th, 1936.

POLYDROSUS PULCHELLUS STEPHENS TO BE REINSTATED IN SPECIFIC RANK, WITH A VARIETY NEW TO BRITAIN (COL.).

BY K. G. BLAIR, D.SC., F.R.E.S.

For some time past I have had two specimens of a *Polydrosus* standing in my collection as a variety, apparently unnamed, of *P. chrysomela* Ol. From this they differed in the metallic scales of the upper surface being almost entirely replaced by long depressed hairs, giving them a very distinct appearance. Small patches of scales remain beneath and around the eyes, on each side of the base of the thorax, at the base of the 5th interval of the elytra and on the metasternum.

These two I sent recently to Dr. D. L. Uyttenboogaart, who returned them as *P. salsicola* Fairm. var. *insquamosus* Everts. I then examined *P. chrysomela* to see if I could find typical *salsicola* confused with it, finally sending a short series to Dr. Uyttenboogaart for confirmation. In returning them he kindly supplied the following notes on the diffences between the two species:—

Chrysomela Ol.	*Salsicola* Fairm.
Upper side almost entirely clothed with green or golden metallic scales. Pubescence double, consisting of soft yellowish prostrate hairs and black somewhat erect setae, the latter very conspicuous when seen sideways. Legs inconstant in colour. Antennae long and slender.	Only one entire longitudinal row of whitish or grey scales on each elytron and two short rows reaching only quarter of the length, all rows sparsely squamose. Pubescence similar but the soft prostrate hairs more conspicuous, the setae sometimes barely visible. Legs always red. Antennae shorter.

Heyden Reitter and Weise, Col. Cat. Europae (1906), give *salsicola* Fairm. as a synonym of *pulchellus* Steph., treating it as a variety of *chrysomela* Ol.; and Horion, Nachtrag Faun. Germ. Käfer (1935), p. 312, while maintaining the specific distinction of *salsicola* admits that the name must cede priority to *pulchellus*. On looking up *pulchellus* in the Stephens collection I find that it is indeed this form more recently (1852) described as *salsicola* Fairmaire.

In Winkler, Cat. Col. Reg. Palaearct. (1932), *pulchellus* and *insquamosus* are both treated as varieties of *chrysomela*, while *salsicola* appears as a distinct species; at the same time these wingless species of *Polydrosus* have, following Hustache, 1925, been transferred to *Eusomus*, a step held by Everts and Uyttenboogaart to be erroneous.

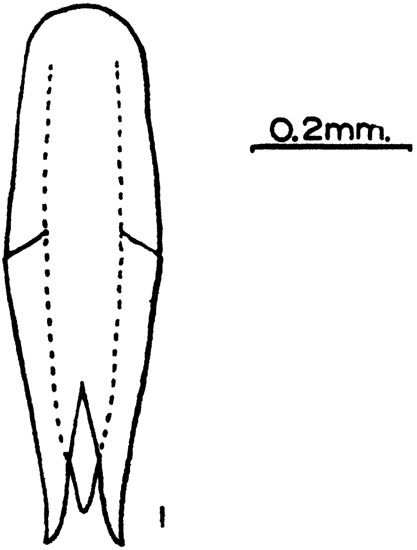
In their distribution, both in this country and on the Continent, *P. pulchellus* and *chrysomela* frequently overlap, though each may occur without the other. My two examples of the var. *insquamosus* were both taken beneath *Plantago Coronopus* at Croyde Bay, while Dr. Elliston Wright has recently taken it, together with *pulchellus* but without *chrysomela*, in the same place and circumstances; the latter species occurs on the saltings at Braunton under *P. maritima*. In the collection of the late G. C. Champion is a specimen of the variety from Sheppey, with examples of both *pulchellus* and *chrysomela* from the same locality, though it does not necessarily follow that they occurred together.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
May 19th, 1936.

NOTES ON THE GENUS *LOBOGESTORIA* REITT. (COLEOPTERA, COLYDIIDAE).

BY HOWARD E. HINTON, B.SC., F.R.E.S.

The genus *Lobogestoria* Reitt. (1878) is very close to the genus *Colydodes* Motsch. (1855) but differs principally as follows: (1) there are no coarse and short setae on the dorsal surface, whereas in *Colydodes* coarse, short setae are present on most of the dorsal surface; and (2) the two produced lobes of the anterior portion of the pronotum are not transversely and deeply sulcate as they are in *Colydodes*.



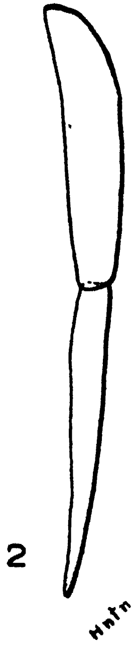


FIG. 1.—*Lobogestoria gibbicollis* (?), dorsal view of aedeagus of a specimen from Costa Rica.

FIG. 2.—The same, lateral view.

So far the genotype, *L. gibbicollis* Reitt. (1878), has remained without a congener. The species described as *Colydodes denudatus* by Arrow (1927, Insects of Samoa, IV, Coleoptera, 1, p. 50) belongs to the genus *Lobogestoria* and is, in fact, very similar to *gibbicollis*.

In a large collection of Colydiidae, sent to me some time ago by Mr. Ferd Nevermann, of Costa Rica, there are eleven specimens labelled *gibbicollis* (?). These specimens vary in size from 3.0 mm. to 4.0 mm. and have the following data: one, Costa Rica, Reventazon, 10.ix.1925 (*F. Nevermann*); three, same data but collected 25.vii.1925; six, same data but collected 3.iii.1928; and one, Costa Rica: Santa Clara, Parismina, Ramal, 22.v.1928 (*F. Nevermann*).

One of these specimens was sent to Mr. W. S. Fisher, of the United States National Museum, who kindly compared it with material supposed to be *L. gibbicollis*. Mr. Fisher writes: 'We have two specimens of *Lobogestoria gibbicollis* Reitt. in the Museum, one specimen collected by Dr. Schwarz in Cuba, and the type of the species described as *Aditoma bifida* by Casey from Florida. I have compared your specimen with both of these specimens and it only differs from both of them in being a little darker in color, and in the projections on the front of the pronotum being a little more widely separated. I would consider it as that species.' I am inclined to believe that the specimen from Florida and the specimens from Costa Rica in reality represent two species, both of which are distinct from the Cuban *L. gibbicollis*. It cannot be definitely said that specimens from these three widely separated localities represent only one species until, at least, the male genitalia of specimens from the three localities are carefully compared. I am not able to do this at present and so have figured (text-figs. 1, 2) the genitalia of a male from Costa Rica, in the hope that some student who possesses males from Florida or other localities will solve this problem.

Zoological Laboratory, Cambridge.
May, 1936.

ON *HYDROPORUS INTERMIXTUS* WALK. (DYTISCIDAE).

BY J. BALFOUR-BROWNE, B.A.

Whilst engaged on the reorganisation of the Dytiscidae in the National Collection two specimens bearing the label 'intermixtus' in Walker's handwriting came to light, one in addition bearing the label 'intermixtus, Walk., A.N.H. (Type).' Both bore British Museum Type labels. One of these specimens was a *Bidessus*, the other an *Hyphydrus*. Reference to Walker's description in the Ann. Mag. Nat. Hist. (3), II, 1858, p. 204, left no doubt that his 'Hydroporus intermixtus' must be the *Hyphydrus*. The description is very poor for recognition, but two clues exist: one, the species is described as 'latus'; and the second, the size is given as

1¾ lines, which is too large for the *Bidessus*, but is correct for the *Hyphydrus*.

Sharp (Aq. Carn. Col., 1882) did not see either type, and seems to have originated the error in attribution, but using the name in error for the *Bidessus* does not give his description priority. He repeats the error in Trans. Ent. Soc. London, 1890, p. 344.

Régimbart (Ann. Soc. ent. Belg., 1892, XXXVI, p. 119) describes a *Bidessus inconstans* from India. In Ann. Soc. ent. France, LXIV, 1895, p. 328, he repeats the diagnosis of *inconstans*, and remarks that it is possibly the *Hydroporus intermixtus* Walck. (sic) and Sharp, but that their descriptions were so short and vague that he could not be sure. In Ann. Soc. ent. France, LXVIII, 1899, p. 227, he gives *inconstans* as a synonym of *intermixtus* Walk. Zimmermann's Catalogue of Dytiscidae, 1920, perpetuates the error.

It is therefore necessary to state that the *Bidessus* becomes *B. inconstans* Régimbart, and that Walker's species is *Hyphydrus intermixtus*. On examination, *Hyphydrus indicus* Sharp was found to be identical with *intermixtus* Walk., and therefore Sharp's name must be sunk as a synonym of this species.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
May, 4th, 1936.

THE ANTS OF THE AZORES.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.
(Department of Entomology, British Museum (Natural History).)

In July, 1929, Messrs. J. Balfour-Browne, J. A. Kitching and A. P. G. Michelmore visited the Azores and captured a number of insects. Among the ants taken were four species which had not previously been recorded from these islands.

In 1908 Professor W. M. Wheeler, on his way to Europe, was able to spend part of a day at Sao Miguel and listed four species, all of which were retaken by Balfour-Browne's party.

In August and September, 1930, MM. L. Chopard and A. Méquignon collected in the Azores. Dr. F. Santschi studied the ants taken and lists ten forms, seven or which had not been previously taken or recorded. The present collection now brings the total up to fifteen forms, of which full particulars are given below.

There are four cosmopolitan species, the rest being mostly of European origin; this supports Alfred Russel Wallace's views on the origin of the fauna of these islands. Since the Middle Ages most of the island trade has been carried on with Portugal, some 900 miles distant.

As Dr. Santschi points out, the presence of the terrible pest, 'The Argentine Ant,' *Iridomyrmex humilis* Mayr, may account for the poverty of the ant fauna, as in time it completely wipes out other species. It continues to spread throughout the world.

It is probable, however, that when a more complete search of the uncultivated parts of these islands, the tops of mountains, etc., is made, the list may be considerably increased.

The only endemic form is Santschi's new variety of *Aphaenogaster senilis* Mayr. *Ponera eduardi* Forel occurs in Madeira, whence it has probably spread to the Azores; this is also the probable origin of *Monomorium carbonarium* Smith. The subspecies *ebeninum* Forel of the *Monomorium* is the only ant of Neotropical origin, but it also may have arrived from Madeira.

The following is a complete list of the species as at present known from the Azores:—

Subfamily Ponerinae.

1. *Ponera eduardi* Forel, Bull. Soc. Vaud. Sci. Nat., **30**, p. 15 (1894).
   Distribution: Sao Miguel: Ponta Delgada, ♀ (W.: B.B.); Furnas; Sete Cidades, ♀, ♀ (C. & M.).—Pico, ♀ (B.B.). Madeira, Canaries and along the entire shore of the Mediterranean.

Subfamily Myrmicinae.

2. *Aphaenogaster testaceopilosa* Lucas, subsp. *gemella* Roger, Berl. Ent. Zeits., **6**, p. 260 (1862).
   Distribution: Pico: forest area, ♀ (B.B.). Balearic Isles; Algiers.
3. *Aphaenogaster senilis* Mayr, var. *açoreensis* Santschi, loc. cit.
   Distribution: Fayal: Horta, ♀.—Terceira: Angra do Heroismo, ♀ (C. & M.).
4. *Pheidole megacephala* F., Ent. Syst., **2**, p. 361 (1793).
   Distribution: Fayal: Consulate, Horta, ♃♃ ♀♀ (B.B.). Cosmopolitan species.
5. *Monomorium carbonarium* Smith, Cat. Hym. Brit. Mus., **6**, p. 127 (1858).
   Distribution: Sao Miguel: Furnas, ♀, ♀ (M.). Madeira.
6. *Monomorium carbonarium* Smith, subsp. *ebeninum* Forel, in Grandidier, Hist. Phys. Madagascar, **20**, j 165 (1891).
   Distribution: Sao Miguel: Ponta Delgada, ♀♀ (W.).—Sao

Jorge: Conbres.—Pico: Sao Matteo, ♀ ♀ (B.B.). Antilles; N. America.

7. *Leptothorax tuberum* F., Syst. Ent., p. 393 (1775).
Distribution: Terceira: Angra. Pico: Serra Gorda (B.B.).
The whole of Europe except the extreme north; Caucasus; Algeria, Bône.

8. *Leptothorax tuberum* F., subsp. *unifasciatus* Latr., Ess. Fourm. Fr., **47** (1798).
Distribution: Sao Miguel: Furnas, ♀ (C. & M.); Pico de Ferro; Joos (M.).
Europe, Central and South.

9. *Tetramorium caespitum* L., Syst. Nat. (ed. 10), **1**, p. 581 (1758): Creighton, Psyche, **41**, p. 197 (1934).
Distribution: Sao Miguel: Ponta Delgada, ♀ ♀ (W.); Furnas, ♀ (C. & M.); Magdalena, ♀ ♀ (B.B.).
The whole of Europe and North of Asia; Japan; Africa, imported; N. America, not imported.

Note.—It was formerly believed that *Tetramorium caespitum* was an introduced species in the United States, and indeed it has spread considerably during the last thirty years, which is in keeping with the character of an introduced species. As Creighton has shown, however, the discovery of an American species of *Anergates*, distinct from the European *A. atratulus* Schenck, entirely negatives this. One would have to assume that, when introduced, a nest of *T. caespitum* contained specimens of the European *Anergates*, and that since then the latter has evolved far enough to rank as a separate species. It would thus appear that *T. caespitum* is of holartic distribution.

10. *Tetramorium guineense* F., Ent. Syst., **2**, p. 357 (1793).
Distribution: Sao Miguel: Furnas, ♀ (C. & M.).
Cosmopolitan species.

11. *Tetramorium simillimum* Smith, var. *insulare* Santschi, Rev. Suisse Zool., **35**, p. 69 (1928).
Distribution: Sao Miguel: Furnas, ♀ (C. & M.). Fiji Isles.

Subfamily Dolichoderinae.

12. *Iridomyrmex humilis* Mayr., Ann. Soc. Nat. Modena, **3**, p. 168 (1868).
Distribution: Sao Miguel: Ponta Delgada, Furnas. Terceira: Angra de Heroismo. Sao Jorge, ♀ ♀ (C. & M.).
Argentine; Brazil.

Subfamily Formicinae.

13. *Acanthomyops niger* L., Syst. Nat. (ed. 10), **1**, p. 58 (1758).

Distribution: Sao Miguel: Ponta Delgada, ♀ ♀ (W.). Sao Jorge: Conbres. Pico: Sao Matteo; Serra Gorda; Magdalena, ☿ ☿, ♀ ♀, ♂♂ (B.B.); Furnas. Terceira: Angra de Heroismo; Monte Brasil, ♀ ♀ (C. & M.).

The whole of Europe; Japan; Turkestan; North of Africa; Madeira; Caucasus; Siberia; China.

14. *Acanthomyops niger* L., var. *grandis* Forel, Ann. Soc. Ent. Belg., **53**, p. 104 (1909).

Distribution: Sao Miguel: Furnas; Ponta Delgada; Sete Cidades. Terceira: Angra de Heroismo. Sao Jorge, ♀ ♀ (C.M. & M.). Andalusia.

15. *Paratrechina longicornis* Latr., Hist. Nat. Fourm., p. 113 (1802).

Distribution: Sao Jorge: Villa Velhas (B.B.).

Cosmopolitan species.

Abbreviations: 'B.B.' for Mr. Balfour-Browne's party; 'C. & M.' for MM. Chopard and Méquignon; 'M.' for M. Méquignon; 'W.' for Professor Wheeler.

LITERATURE.

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British Museum (Natural History),
Cromwell Road, London, S.W.7.
May 21st, 1936.

THE PARASITES OF BRITISH BIRDS AND MAMMALS.

VIII.

SOME ADDITIONAL RECORDS OF BAT PARASITES.

BY GORDON B. THOMPSON
(Department of Entomology, British Museum (Nat. Hist.)).

Since the publication of my first note, 'Records of Bat Parasites' (1935), some additional specimens have come to hand, thanks to the kindness of Messrs. Michael Blackmore, Percy Muschamp and D. H. S. Davis. These new records extend our knowledge of the parasites of some species of bats which were not included in the first note, but there still remains a great deal of collecting to be done before one can attempt a complete summary. Cimicidae are particularly needed, for there seems to be some doubt as to which species occur in our islands. The two species recorded are *Cimex pipistrelli* Jenyns (1839) and *Cimex dissimilis* Horvath (1910). These parasites, which are in many respects similar to the familiar bed-bug, *Cimex lectularius* Linn., should be sought for in the resting-places of the bats. One gathers from the records of these interesting parasites that they are by no means common.

Regarding the bat-fleas, seven species belonging to the genera *Ischnopsyllus* and *Nycteridopsylla* are known to occur in the British Isles. Of these, *I. octactenus* Kolenati is by far the commonest species. *I. hexactenus* Kolenati, *I. elongatus* Curtis and *I. simplex* Rothschild have been recorded a fair number of times. *I. intermedius* Rothschild, *N. longiceps* Rothschild and *N. eusarca major* Rothschild have been recorded on only a few occasions and all from hosts collected in the S.E. of England. *I. hexactenus* Kolenati and *I. octactenus* Kolenati are the only species recorded from Ireland, and there are very few records of any of the species from Scotland and Wales.

I am indebted to Dr. Susan Finnegan for giving me access to the literature on the Acarina.

ACARINA.

IXODOIDEA.

IXODIDAE.

Ixodes vespertilionis Koch, 1844.

One female from *Rhinolophus ferrum-equinum insulans* Barrett-Hamilton (Greater Horseshoe Bat), Somerset, Cheddar Caves, viii.1933 (*R. C. Burbank*), recd. from D. H. S. Davis.

Only three specimens, all females, have been previously recorded from the British Isles.

ARGASIDAE.

Argas vespertilionis (Latreille), 1796.

Six larvae from the breast and dorsal regions of *Pipistrellus pipistrellus* (Schreber) (Pipistrelle), adult ♀, Devon, Ilfracombe, Langleigh, 15.viii.1935 (*M. Blackmore*).

Larvae from seven specimens of *Plecotus auritus* (Linn.) (Long-eared Bat), Leicestershire, Bradgate Park, 1935 (*P. Muschamp*).

PARASITOIDEA.

PARASITIDAE.

Spinturnix vespertilionis (Linn.), 1758.

Four specimens from *Myotis daubentoni* (Kuhl) (Daubenton's Bat), an immature ♂ and an adult ♂, Yorks., Hemsley, Duncombe Park, viii.1935 (*M. Blackmore*).

One specimen from *Myotis mystacinus* (Kuhl) (Whiskered Bat), immature ♂, Devon, Ilfracombe, Langleigh, 15.viii.1935 (*M. Blackmore*).

All the specimens of *Spinturnix* sp. were collected from the wing-membranes.

A Correction. As a result of an examination of the mites recorded in my first note, Mr. H. Britten has communicated the following correction of Dr. Vitzthum's determination :—

DERMANYSSIDAE.

Liponyssus nyssae Hirst, 1921.

Five females from *Eptesicus serotinus* (Schreber) (Serotine Bat), Kent, Faversham, 25.viii.1934 (*M. Blackmore*).

Liponyssus chiropteralis Hirst, 1921.

One female from *P. pipistrellus* (Schreber), adult ♂, Devon, Ilfracombe, Langleigh Farm, 14.v.1934 (*M. Blackmore*).

These mites were determined by Dr. Vitzthum as *Ceratonyssus musculi* (Koch) and recorded by me as such last year. *L. nyssae* Hirst was originally described from specimens taken off an Elephant Shrew in Nyasaland, and as far as I am aware this is the first record of its occurrence on a bat. *L. chiropteralis* Hirst has been recorded from *P. pipistrellus* by Hirst (1921).

INSECTA.

SIPHONAPTERA.

ISCHNOPSYLLIDAE.

Ischnopsyllus hexactenus (Kolenati), 1856.

One female from *Barbastella barbastellus* (Schreber) (Barbastelle), Berks., nr. Henley-on-Thames, Capt. Eric Noble's Cave, 2.xii.1934 (*M. Blackmore*).

DIPTERA.

NYCTERIBIIDAE.

Nycteribia (*Listropoda*) *latreillei* (Leach), 1817.

Two males and a female from *Myotis daubentoni* (Kuhl), immature ♂, Yorks., Hemsley, Duncombe Park, viii.1935 (*M. Blackmore*).

Two females from the same host species, Yorks, Hemsley, 8.vii.1924.

Females from *Rhinolophus hipposideros minutus* (Montagu) (Lesser Horseshoe Bat), Leicestershire, Bradgate Park, 1935 (*P. Muschamp*).

Mr. Blackmore's specimens were collected from the fur on the breast.

SUMMARY OF THE RECORDS.

Host.	Parasite.
P. pipistrellus (Schreber)	(I) *Argas vespertilionis* (Latr.).
	(A) *Pteronyssus chiropteralis* Hirst.
M. mystacinus (Kuhl)	(A) *Spinturnix vespertilionis* Linn.
M. daubentoni (Kuhl)	(A) *Spinturnix vespertilionis* Linn.
	(N) *Nycteribia (Listropoda) latreillei* (Leach).
P. auritus (Linn.)	(I) *Argas vespertilionis* (Latr.).
E. serotinus (Schreber)	(A) *Pteronyssus nyssae* Hirst.
B. barbastellus (Schreber)	(S) *Ischnopsyllus hexactenus* (Kolenati).
R. ferrum-equinum insulans Barrett-Hamilton	(I) *Ixodes vespertilionis* Koch.
R. hipposideros minutus (Montagu)	(N) *Nycteribia (Listropoda) latreillei* (Leach).

(I) = Ixodoidea. (A) = Acarina (Mites). (S) = Siphonaptera. (N) = Nycteribiidae.

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HIRST, S. 1921. Proc. zool. Soc. Lond., pp. 776-778.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
April 2nd, 1936.

The Origin of the 'Click' in Sternoxia.—That the 'click' in Sternoxia was not, as generally supposed, caused by the thoracic spine falling into its socket, was first suggested to me by Dr. Murray, of Liverpool Museums, with the suggestion that I studied the matter. I found *Athous haemorrhoidalis* the most suitable type available, owing to its comparatively large size and the fact that it 'clicks' freely when handled.

If the beetle be so held that light may be seen between the thoracic spine and the thorax, the abdomen being held between the thumb and index finger of one hand and the thorax similarly by the other hand, it will be seen that the thoracic spine may be prevented from falling into its socket or contacting in any way with the metathorax during the 'click,' proving conclusively that such is not the manner of its production. Further observations led me to believe that the 'click' was produced by the introduction of the hind-angles of the thorax beneath the shoulders of the elytra, the head and thorax being then brought swiftly downwards. If a dead specimen be relaxed, the sound may be produced by holding as described above and swiftly imitating this action, even if the thoracic spine be first removed.

On forwarding these notes to Dr. Murray they were found to corroborate his own observations. Further study, particularly as to the reason for the phenomenon, should prove of interest.—CHAS. MOLD, 'Holmbush,' Albert Road, Polegate, Sussex: *May 9th*, 1936.

[My own observations on the living beetle fail entirely to support Mr. Mold's contention.—K.G.B.]

Irish Coleoptera: *New Records*.—Subsequent to my report in this Magazine, Vol. LXXI, p. 89 (1935), the following would seem, after such enquiries as I have been able to make, to be new records for the County or other area specified in each case.

1. *Carabus catenulatus* Scop. At Lough Fea, Co. Tyrone, on 24th July, 1926.

2. *Bembidion andreae* F. var. *bualei* Duv. (*anglicanum* Sharp). One specimen, taken on the shore of a shallow pond near Newtownards, Co. Down, on 2nd June, 1934. This is new for Ulster, as the only locality known hitherto has been in Co. Dublin. This specimen is said by Dr. Blair to be 'rather a dark form.'

3. *Haliplus wehnckei* Gerh. From the Lagan Canal and Kirkcubbin, both in Co. Down, August, 1934.

4. *H. confinis* Steph. At Soldierstown, Co. Antrim, in the Lagan Canal, 24th August, 1935.

5. *Hydroporus angustatus* Sturm. At Carrick-on-Shannon, Co. Leitrim, on 16th July, 1934.

6. *Coelambus confluens* F., and

7. *Agabus nebulosus* Forst., both through Miss G. C. Scott, who got them at Newmarket-on-Fergus, Co. Clare, on 7th July, 1935.

8. *Gyrinus urinator* Ill. One taken at Recess, in West Galway, on 12th July, 1934. New for Connaught.

9. *G. marinus* Gyll. One (female) from River Clare, in North Galway, on 16th July, 1934

10. *Oxytelus complanatus* Er. One at Castlerock, Co. Derry, on 5th August, 1933.

11. *Tenebroides mauritanicus* L. One on Christmas Day, 1934, at Belfast, Co. Antrim.

12. *Monotoma picipes* Herbst. One found at Drum, Co. Antrim, on 21st May, 1932.

13. *Atomaria apicalis* Er. One in cut-grass in a garden at Belfast, Co. Antrim, on 7th May, 1934. A new record for Ulster.

14. *Cyphon ochraceus* Steph. One at Ballintoy, Co. Antrim, on 7th September, 1934.

15. *Phyllobius pomonae* Ol. Two found at Lambeg, Co. Antrim, on 21st June, 1935, and three by the Lagan Canal, Co. Down, on 29th June, 1935.

For help in the identification of Nos. 3 to 9, I am indebted to Professor Balfour-Browne, and in the case of the others (except No. 1) to Dr. K. G. Blair, of the British Museum.—W. M. CRAWFORD, 58 Marlborough Park South, Belfast: *4th April*, 1936.

Notonectidae and Corixidae collected in Derbyshire in 1936.—The following species were collected during February, March and April. The specific names are followed by numbers indicating the various localities in which the species were captured. These localities are: 1, Middleton Moor; 2, Langley Common;

3, Alkmanton; 4, Nr. Church Broughton; 5, Boylestone; 6, Nr. Arbor Low: 7, Monyash; 8, Swarkestone Bridge; 9, Little Eaton; 10, Brassington; 11, Meynell Langley; 12, Dethick Common; 13, Matlock; 14, Dalbury Lees; 15, Holloway; 16, Cromford Moor; 17, Hardwick Park.

Notonecta glauca L., 2, 3, 5, 8, 10, 11, 14, 16 and 17; *N. furcata* F., 16 (10.iv.1936); *N. maculata* F. 1 (2.ii.1936); *Corixa geoffroyi* Leach, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14 and 16; *C. dentipes* Thoms., 17 (14.iv.1936); *Sigara hieroglyphica* Duf., 2, 3, 5, 6, 7, 8, 9, 10, 14, 15, 16 and 17; *S. sahlbergi* Fieb., 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14 and 16; *S. linnaei* Fieb., 2, 8 and 9; *S. striata* Fieb., 3, 5, 8, 9, 11 and 17; *S. distincta* Fieb., 16 and 17; *S. falleni* Fieb., 3, 5 and 8; *S. moesta* Fieb., 12; *S. limitata* Fieb., 2 and 5; *S. fabricii* Fieb., 2, 5, 6, 9, 10, 13, 14, 15 and 16; *S. fossarum* Leach, 17; *Callicorixa praeusta* Fieb., 2, 11, 14 and 17; *Cymatia bonsdorffii* Sahlb., 17.

According to Butler the following are new to the Derbyshire list: *Notonecta furcata* F., *N. maculata* F., *Corixa geoffroyi* Leach, *C. dentipes* Thoms., *Sigara hieroglyphica* Duf., *S. sahlbergi* Fieb., *S. distincta* Fieb., *S. falleni* Fieb., *S. limitata* Fieb., *S. fossarum* Leach, *Callicorixa praeusta* Fieb. and *Cymatia bonsdorffii* Sahlb.—H. D. SLACK, The Moor, Radbourne Road, Mickleover, nr. Derby: *May*, 1936.

Hemiptera-Homoptera in Dumfriesshire.—Last year was a poor one for Homoptera in Southern Scotland, but the following species were met with, along with others already recorded. *Bythoscopus alni* Schrk., locally common on alder. *B. flavicollis* Linn., common on birch. I have met with all the colour-varieties described by Edwards excepting No. 3. *Agallia puncticeps* Germ., plentiful by sweeping hedge-banks. I have beaten it from *Ulex* on Nutberry Moss so late as the 6th of October. *Deltocephalus pascuellus* Fall., fairly common on rough ground. *D. pulicaris* Fall.; I swept a few along a hedge-bank at Chapelknowe in July. *Athysanus brevipennis* Kbm., common on the moors. *Thamnotettix aurantipes* Edw., not rare on Raeburn Flow and other mosses. *Cicadula warioni* Leth., on the coast at Browhouses and Eastriggs. *Chlorita flavescens* Fabr., a few from Scotch fir trees at Nutberry at the end of April. *Eupteryx aurata* Linn., common on nettles, etc. *E. britteni* Edw., local. I have it from several localities in this county, generally taking it in the company of others of its genus. Some of my specimens were confirmed by Mr. Britten himself. *Typhlocyba ulmi* Linn., a few near Annan in August. *T. quercus* Fabr., sometimes not uncommon on oak at Nutberry in autumn. *T. douglasi* Edw., one from beech at Gretna in August. *T. tenerrima* H.S., local on brambles. I have found it in December when the autumn has been mild. *T. sexpunctata* Fall., one from sallow at Quentin's Hill in September. *Megamelus notula* Germ., rare; Nutberry Moss in August. *Kelisia vittipennis* J. Sahlb., rare; Newton Moss in August. *Conomelus limbatus* Fabr., abundant on the moors. *Delphax venosa* Germ. is also not rare on the moors. *Aphalara calthae* Linn., Nutberry Moss in June. *A. exilis* W. and M., local but more abundant than the preceding. *Psyllopsis fraxinicola* Först., locally common on ash in August. *Psylla peregrina* Först., local on hawthorn in May and June. *P. nigrita* Zett., on Scotch firs in winter and from *Ulex* in April. *P. spartii* Guér., locally common on broom in June. *Arytaena genistae* Latr., local, but common where it occurs, on broom in spring and autumn. *Trioza remota* Först., rare, one from oak at Nutberry in October.—JAS. MURRAY, 6 Burnside Road, Gretna: *March 30th*, 1936.

THE 'SPRUCE CONE BUG,' *GASTRODES ABIETIS* LINN. (HEMIPTERA-HETEROPTERA: LYGAEIDAE).

BY A. E. AITKINS, B.SC.FOR.
(Forestry Department, University of Aberdeen.)

PLATE II.

INTRODUCTION.

An investigation started about the end of October, 1935, upon the variation in cone characters of *Picea excelsa* (Norway Spruce), and the percentage germination of the seed therein was the indirect means of discovering the two bugs known as *Gastrodes ferrugineus* Linn. (common) (1) and *G. abietis* Linn. (rare) (1).

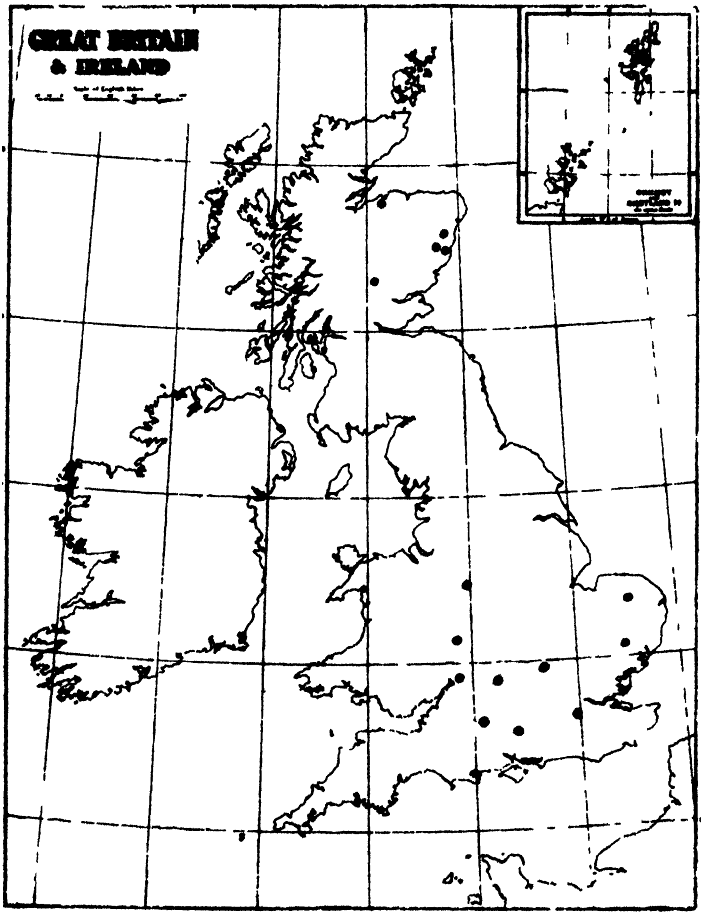
The first indication of the existence of the former was in the laboratory, when it was noticed emerging from the cone scales after the cones had been allowed to dry for some days. The first collection was made from the woods of Hazlehead, Aberdeen. The identification of *ferrugineus* led me to look for the rarer species *abietis*.

HISTORICAL.

Beyond giving a general description of the bug *Gastrodes abietis* and a key to distinguish it from *G. ferrugineus*, Saunders (1), has not mentioned anything of its life-history. Butler (2), however, mentions that the ova for this country are unknown, and the larva is undescribed. With regard to the life-history, he states that ' the imago hibernates between the scales of " fir " cones and also under the bark ' (Reuter). Fletcher found it commonly on spruce firs in Worcestershire in the early spring of 1857; also in March, 1880, he beat two specimens from spruces, and obtained three others from the cones. I have found it in May on a fallen spruce, and Hamm similarly found it in April in the cones of a fallen tree. All our British records are for the winter and spring, from February to May, and in December. Of the Continental authors, Flor gives August and September, and Reuter, May, July and August, but the insect is nowhere common.'

With regard to its habitat, Butler goes on to state: 'This insect is arboreal in habits, and in that respect differs from most of the Lygaeidae. . . In Belgium it has been found on walnut.'

Nägeli (3) has carried out a thorough investigation of *G. abietis* and *G. ferrugineus*, the material for which he procured from under pine-bark and pine-cones. The first egg-laying by *abietis* was on the cone-scales of a pine-cone. This took place in April and continued until the beginning of May, and it had reached its climax by about 4th May, whereas *ferrugineus* was still well behind its climax. The period between egg-laying and hatching of the 1st stage nymph under laboratory conditions took from about 11-15 days. Thus under natural conditions it will take much longer, probably a month, depending upon the temperature.



Map showing distribution of *G. abietis* in the British Isles.

Nägeli has proved conclusively that the adults cause no damage by their feeding habits to the needles of pine or spruce, and although they inhabit the bark no damage is done. He makes no mention of the relationship of these bugs to the seed.

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We should be grateful if readers would help by sending us such material as nests of birds (pigeon, fowl, sparrow, starling, house-martin) and of rats and mice, or materials near such nests, which may harbour bed-bugs Observations concerning bed-bugs in such situations will also be valuable, whether made at home or abroad

Material should be well and securely packed and addressed to C Johnson, Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W C 1 All postage costs will be refunded

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AN ANNOTATED LIST OF THE ADDITIONS TO THE BRITISH COLEOPTEROUS FAUNA.
Made since the Publication of the Supplementary Volume (VI.) of
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By Horace St. J. Donisthorpe, F.Z.S., F R.E S., etc
Introduction by James J. Walker, M.A., R.N , F.L.S.
(Reprinted from the Entomologist's Monthly Magazine, 1929-1931).
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DISTRIBUTION.

G. abietis is found in Northern and Central Europe and Siberia; in Norway it reaches the parallel of 70°, and in the British Isles it has been recorded from the following English counties: — Staffs, Norfolk, Suffolk, Worcester, Gloucester, Oxford, Herts, Surrey, Hants and Wilts.* Norman found it also in Scotland, at Pitlochry and Forres. To this list I add Kincardine and Aberdeenshire (see map).

The Forestry Commission area at Durris, Kincardine, was the next locality to be visited by me on November 3rd, 1935. Cones from the tops of standing trees were collected, and here again the flat bugs were found in considerable numbers, and it was obvious that both species were present; in some instances both species were beaten from a single cone, in others only *G. abietis* was found. The percentage of *abietis* to *ferrugineus* at Durris was 61 to 39 respectively.

Since the egg and larval stages of *abietis* were unknown in this country, this made me search each cone thoroughly and carefully, but no trace could be found of them in any single cone from Durris.

However, Bard's Wood at Fetteresso, Kincardine, was a happy hunting-ground for *abietis,* about 97 per cent. of the total number of bugs taken being of this species. As at Durris, the cones were removed from the tops of the trees (60-70 ft. high). This collection was made on November 24th, 1935.

From the simple act of collecting these cones, two facts arise: — (*a*) that those cones most easily available, *i.e.* the oldest cones, did not harbour anything like the population of that found in the younger cones; (*b*) *ferrugineus* was most common in the oldest.

The fact that *abietis* is considered rare is probably due to the fact that these bugs prefer the younger cones. On an average, one pair of bugs were found per cone, but as many as six were recovered from a single cone. This suggested to me that although *ferrugineus* merely hibernated under cover of the older cones, *abietis* was more closely related to the cone and perhaps to the seed.

This fact was further substantiated by the recovery of several nymphs of different ages, as proved by the various stages in the development of the mesonotum, wing-buds, and also in the obvious gradations in size. These nymphs were beaten from three cones, the remainder liberated only adults.

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* Recorded from Glamorgan, Wales, by Hallett, Ent. mon. Mag., 1928, p. 64 (W.E.C.)

The flat shape of these bugs is admirably suited to their environment; they can move about in the cone, under cover of the cone-scales, and even the considerable shock of beating the cone fails in many instances to dislodge them, the reason being that the insect, by virtue of its well-developed walking legs, can wedge itself against the cone-scales.

Then again the humid or damp atmosphere inside the cone is favoured especially by *abietis*, since observations of both species kept in (*a*) a dry atmosphere and (*b*) a humid atmosphere proved that *ferrugineus* could live longer in a dry atmosphere, whereas *abietis* succumbed quickly.

Since the egg stage was not found, the number of distinct nymphal or larval stages in the complete life-history for this country is yet uncertain. Nägeli (3), who has thoroughly investigated the life-history of both of these bugs, states that *abietis* passes through five nymphal stages before reaching the adult stage. Upon examination of the fourteen nymphs recovered from the cones, four of these nymphal stages are obviously present.

If the degree of development of the mesonotum is taken as a basis of classification, then the fourteen nymphs examined can be enumerated as follows:—

(*a*) One 2nd stage nymph, in which the basal margin of the mesonotum appears as a wavy line; length 2 mm.

(*b*) One 3rd stage nymph, in which the basal margin of the mesonotum is similar to that of the 2nd stage, but is slightly more exaggerated and the beginning of the development of the hemelytra appears as two obvious sac-like lobes; length 3 mm.

(*c*) Seven 4th stage nymphs in which the hemelytral sacs are now formed and easily seen, but which do not overlap the metanotum; the latter is obvious as a pale greyish-white area behind the mesonotum. The length varies from 3 mm. to 4 mm.

(*d*) Five 5th stage nymphs in which the hemelytra have developed to an extent in which they overlap the third abdominal segment; the paler coloured membranous wings can be clearly seen developing below the darker coloured hemelytra; the area of the scutellum is now well defined, and all that can be seen of the metanotum is a small white area at the angle formed by the developing membranous wings. Length varies from 5 mm. to 6 mm.

Since there tends to be some slight variations in the characters of the adult *G. abietis* described by Saunders (1) and those specimens which I found in the north, and moreover since I have drawn comparisons of the gradation in common characters between the nymphs and the adult, I feel that a detailed description of the adult *G. abietis* should be included.

DESCRIPTION OF THE ADULT.

G. abietis : *General*: *G. abietis* is recognised at once by its flat oval shape; in length it varies from 6½-8 mm.; the average breadth of the pronotum is 2 mm., at the widest part of the abdomen it is 3 mm.; the apex of the abdomen is gently rounded. These bugs emit an unpleasant odour owing to the presence of dorsal abdominal glands.

The following is a table to distinguish *abietis* from *ferrugineus* :—

	G. abietis.	*G. ferrugineus.*
1. Antennae.	First antennal segment reaches, or may extend slightly beyond, the front of the head. The first segment and the proximal half of the second segment of the antenna are reddish-brown, the remainder is black.	First antennal segment extends well in front of the head. All the antennal segments are black.
2. Colour Scheme.	Presents a polished shining appearance.	Wholly dull.
3. Scutellum.	Forms an isosceles triangle shining black in colour with a groove or line down each side.	Dull black, without grooves.
4. Pronotum.	Lateral margins are lighter coloured throughout their length.	Lateral margins are lighter coloured only posteriorly.
5. Hemelytra.	Patterned — the corium a light brown, the clavus is greyish-yellow. The angle between the coriums is white —while the remainder of the membrane is a dusky grey.	Uniform dull dark red colour over the whole.

Detailed description of G. abietis. ♂ and ♀ (see figure).

The head is shining black, small in size and from above resembles a triangle set upon a trapezium. The pointed front of the head is covered with short fine white hairs. The large conspicuous compound eyes are set in the lower half of the trapezium, almost touching the pronotum well out from the side of the head. The ocelli are two in number, set above and behind the compound eyes almost touching the pronotum; they are not clearly visible in every case.

The antennae arise laterally from the upper half of the trapezium, in front of and slightly below the level of the compound eyes. They are four-jointed, the first joint extends to the front of the head and is four times as long as broad; it is broader than any of the three remaining joints, reddish-brown in colour and covered with short, fine hairs, at its distal end the hairs are obvious as a ring, obscuring the articulation of the second joint. The second joint is 3.5 times the length of the first joint, but is much narrower, except at its distal end, where its broadens out to receive the third joint; in colour it is the same as the first joint for the proximal half of its length, but the distal half is black; the whole joint is sparsely covered with fine white hairs. The third and fourth joints are subequal in length and two-thirds the length of the second joint, black in colour and covered with white hairs; the fourth joint is oval in shape and at its distal end is pointed, but not sharply so. The pubescent covering is more dense here than in any of the other joints.

In some cases the rostrum extends only as far as the second pair of coxae, but in the majority of specimens examined it extended almost as far as the third pair of coxae. The rostrum is four-jointed; the first and third joints are subequal in length, the second joint is almost twice as long as No. 1, the fourth joint is half the size of No. 1. The first joint is the broadest and a deep, wide groove is obvious; the second joint is more rounded and much narrower than No. 1 or No. 3, and is not so clearly grooved; the third joint is broader than No. 2, narrow at its proximal end, gradually widening distally; it is more obviously grooved, the fourth joint is rounded and fusiform in shape; a slight groove is obvious along its length, the tapering distal end resembles a nozzle-shaped organ. The whole of the rostrum is covered with delicate white hairs, very obvious as a double row along each side of the groove; the groove is remotely pitted and at the distal end a conspicuous ring of hairs can be seen, the function of which is probably sensory. The first three joints are a shining reddish-brown, while the fourth joint is black in colour. The side margins of the pronotum and the area adjoining the scutellum are a shining golden-brown, the pronotum is flat with narrowly foliaceous sides much widened posteriorly, and excepting the margins is shining black, and this latter area is irregularly punctured.

The scutellum is shining black, irregularly but definitely punctured and tending to be ridged, with a smooth shining groove or line down each side.

The front legs are more highly developed than the others. The coxae in every case are yellowish-red, the trochanters are reddish-brown. The front femur is three times as long as broad, oval in shape, dark reddish-brown in colour; the ventral edge is toothed, the first six teeth are small, the seventh is slightly larger, while the eighth is a large prominent tooth clearly visible by the naked eye. The remaining five teeth are crowded towards the distal end of the femur and become progressively smaller. The femur is slightly punctured throughout, and distally is sparsely covered with delicate white hairs. The tibia is almost as long as the femur but is much narrower except distally, where it broadens out to receive the articulation of the first tarsal segment. The tibia is a golden-brown colour, slightly punctured throughout and there is a sparse covering of white hairs. The tarsi are three-jointed, the first joint being the largest, it is golden-brown in colour, and more densely covered with white hairs; the second joint is small and similar to No. 1 in colouring; the third tarsal joint is proximally yellowish-brown but distally it is black, and two well-defined yellow claws can be observed; moreover this joint is more densely pubescent. The colouring of the middle and hind legs is similar to that of the front leg, but in each case the femur is much narrower than the front femur, and the denticulate edge consists merely of three small black teeth at the distal end of the femur. The front and middle femora are equal in length, and are two-thirds the length of the hind femur. The hind tibia is one-third longer than the fore and middle tibia and similar in colour to the front tibia. The tarsi are the same as above.

The hemelytra overlap scissor-wise flat over the body when at rest and cover the whole of the abdomen. The clavus (see fig.) is pale yellow to grey in colour and a row of close set pits runs along each side; within the triangular clavus the pits are irregularly arranged. The corium is reddish-brown, becoming more yellowish-brown where it meets the clavus; at the anal angle a black inverted L-shaped area is clearly visible; the corium is punctured similarly to the clavus. The membrane is a dusky grey colour, with a white area in the angle of the corium, below this white area is an irregular darker grey patch; traversing the membrane are five veins, often only four are visible.

DESCRIPTION OF THE SEVERAL NYMPHAL STAGES.

Second Stage Nymph. Length: 2 mm. (fig. 2).

The head is similar in shape to that of the adult, but more rounded; it is shining yellowish-red in colour, smooth and glabrous, the top of the head is slightly flattened, sutures arising at the compound eyes meet in the middle line and continue back to the thorax; this is probably a line of ecdysis. No ocelli are present. The first joint of the antennae is pale yellow, half the size of the second, and does not extend in front of the head, the second joint is subequal in length to the fourth, pale yellow in colour, the third joint is two-thirds the length of the second and is also pale yellow, the fourth joint is proximally yellow, distally it tends to become reddish-brown, the antennae as a whole present a lustrous appearance, glabrous and smooth.

The rostrum is four-jointed and extends to about the fourth abdominal segment when at rest beneath the body. The first segment is yellowish-red, the second joint is proximally yellowish-red, but pale yellow for the greater part of its length, this joint is twice the length of No. 1, the third joint, equal in lengh to No. 1, is pale yellow, the fourth joint is half the length of No. 1 and is reddish-brown, it tapers towards the distal end end; the whole of the rostrum is grooved dorsally but not distinctly so.

The pronotum is the largest segment of the thorax, the sides are round, the margins are a golden brown, the remainder is greyish in colour. The mesonotum is half the size of the former and is coloured throughout a golden-brown, the distal margin of the mesonotum is wavy. The metanotum is the smallest segment of the three, and is not very clearly defined, it is also golden-brown in colour.

The legs are greyish in colour throughout and weakly developed at this stage; but even here the anterior femora are the most highly developed and distally one prominent tooth is present. The tarsi are two-jointed, the first joint being half the length of the second; two tarsal claws are present on the second joint.

Seven abdominal segments are visible, shining golden-brown in colour; the third and fourth segments have a definite darker red area centrally demarcated; below each area is an oval gland. The whole of the abdomen appears to be feebly pitted and differs from that of the third stage nymph in being less oval in shape.

Third Stage Nymph. Length: 3 mm. (fig. 2).

The head is similar in shape to that of the previous stage, but is of a shining brown colour; it is remotely pitted and sparsely covered with fine white hairs; the same suture for ecdysis is present as in the previous stage, but is continued back to the distal margin of the mesonotum. No ocelli are present. The antennae are proportionate in size to those of the second-stage nymph; the joints are greyish in colour and the whole is sparsely pubescent with short white hairs.

The rostrum extends to the third abdominal segment, similar in colouring to that of the second stage nymph, but here it is more stoutly developed; the fourth segment tapers to a blunt point at its distal end.

The pronotum is again the most largely developed of the thoracic segments, brownish in colour, and an evident line of ecdysis passes down the centre. It is smooth and unpunctured. The sides of the pronotum are rounded. The mesonotum is again brownish in colour and only half the size of the pronotum; the wavy distal margin is more exaggerated here than in the case of the second stage nymph, and two darker brown areas in the distal angles of the mesonotum demarcate the developing hemelytra. The metanotum is even more reduced in proportion to the pro- and mesonotum than in the previous stage, and shows up more distinctly as a pale grey area.

The legs are pale yellow in colour throughout, and except for a greater development in size are similar to those of the previous stage.

Seven abdominal segments are visible, the abdomen in this stage is more rounded than in the previous stage. On the distal margin of the third segment an oval gland is present; on the fourth and fifth segments the glands are preceded by dark red areas. The abdomen is dark red along each side, and pale yellowish-red along the middle.

Fourth Stage Nymph. Length varies from 3 mm. to 4 mm. (fig. 2).

The head is now becoming more heavily chitinised and resembles more closely in shape that of the adult, dark reddish-brown in colour, remotely pitted and sparsely covered with white hairs. No ocelli are present. The antennae have the same proportions as before, but No. 1 joint and No. 2, except the distal end, are yellow, while the remainder are dark red in colour. The rostrum extends as far as the second abdominal segment; the colour scheme is similar to that of the second-stage nymph except that it is becoming darker and more chitinised.

The pronotum and mesonotum are dark reddish-brown; the pronotum is becoming more foliaceous, and the lighter coloured margins are beginning to be demarcated from the more roughened and darker central portion. The mesonotum shows much greater development now that the hemelytra are clearly defined and developing as sac-like outgrowths, reddish-black in colour, the membranous wings have also been demarcated at this stage, but are not so clearly defined as in the next stage. The metanotum is not distinct except for a white clear patch behind the mesonotum.

The legs show increased development in size over the third stage nymph but are similar in colour. The teeth on the front femur show up as one large tooth followed by three small teeth, one larger one, and a minute tooth, these are yellow in colour. The tarsi are 2-jointed; the second joint tends to be darker tipped and has two yellow claws.

Seven abdominal segments are apparent, the central area is yellow-red in colour, the margins appear darker red, while the terminal portion of the abdomen is becoming brown in colour. The abdomen in this stage tends to lose its oval form and become more parallel-sided. The oval gland-dot on the second segment has a yellow area on each side. The dark red patch on the third and fourth segments again precedes an oval gland.

Fifth Stage Nymph. Length varies from 5 mm. to 6.5 mm. (fig. 3).

The head is now fully chitinised, black in colour and is similar to that of the adult; it is now definitely but remotely pitted; the front of the head, the area behind and in front of the compound eyes are sparsely covered with fine white hairs. No ocelli are present. The first joint of the antenna and the proximal two-thirds of the second joint are golden-brown, the remainder is black. The entire antenna is slightly punctured, and each joint is pubescent, the third and fourth more densely so.

The rostrum extends as far as the third pair of coxae, the first segment and distal end of the fourth are black, the others are golden-brown.

The pronotum is almost fully chitinised, and has almost the same foliaceous shape as the adult, but only the collar-like area next the head is black, the remainder—except the lateral and distal margins of a golden-brown—is dark reddish-brown. The scutellum is now formed, but it has rounded sides and no grooves have yet formed; it is dark reddish-brown in colour, slightly pubescent, and smooth.

The hemelytra now extend as far as the third abdominal segment, and can be seen as definite extended sac-like structures, dark brown in colour; the developing membranous wings are now formed and are visible below the hemelytra as light or brown areas.

The metanotum is now a small white triangular patch in the angle of the membranous wings.

The legs are now almost fully developed, and much darker in colour than in the fourth stage nymph; the fore femur has one large tooth followed by three smaller equal-sized teeth. The legs are now slightly pubescent and remotely pitted throughout. The tarsi are two-jointed, the distal end of the second joint is black.

The abdomen has the adult oval shape at this stage, only part of the first and second segments are visible; the remaining four segments are brown in colour, lighter towards the centre, darker brown towards the margins. The glands on the third, fourth and fifth segments are again visible, the latter two having darker areas preceding them.

FEEDING HABITS AND DAMAGE.

As this bug is obviously an inhabitant of the forest, two questions arise: (1) upon what does it feed and in so doing (2) what possible damage is liable to accrue? Since this insect is a member of the Order Hemiptera it can only absorb liquid food, and hence we cannot hope to find any obvious puncture upon the seed, the needles or the bark. Nägeli (3) has thoroughly investigated the possible damage to the needles and the bark and decided that it was nil. At first, the present writer was tempted to correlate the low percentage germination of spruce-seed from these cones with the presence of *G. abietis*. The reason for this was that about seventy per cent. of the seed cut open and examined showed no trace of endosperm, and the embryo when present was shrivelled up. To test this theory fresh seeds of Norway spruce (*Picea Abies*), Sitka spruce (*Picea sitchensis*), Scots pine (*Pinus sylvestris*), Japanese larch (*Larix Kaempferi*), European larch (*Larix decidua*) and Douglas fir (*Pseudotsuga taxifolia*) were soaked and into each petri dish containing these seeds twelve bugs were liberated.

Observations of the feeding of these insects had to be made at night, since their habits are nocturnal, and unfortunately in no instance did the writer observe the bristle-like stylets pierce the seed-coat. Instead the insects seemed to prefer the moisture on the blotting-paper, which they sucked up continuously. Thus it would appear that during the winter their greatest desire is water. But although the life-history appears to be passed under cover of the cone-scales, the adults and larvae must have some other liquid food so that the former may live and the latter increase in growth and size. The most likely source of this liquid food, if the seed does not supply it, is from the needles. Nägeli (3) has shown that these bugs do leave the cones during the night and make extensive excursions over the needles, and he has actually observed the adults piercing the needles with their stylet-like bristles and sucking the juices therein; but no trace of feeding is left upon the needles, hence they are not damaged. The adults, however, do show cannibalistic tendencies, and any member which dies off is immediately set upon by the surviving members and the body juices of the victim are extracted.

Thus for the present no tangible proof of damage to the seed can be given, but if any positive results are gained in the spring or summer they shall be published.

I would like to thank Dr. Guy Morrison, of the Aberdeen Agricultural College, for help in the identification of *Gastrodes ferrugineus*.

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University of Aberdeen.
March 4th, 1936.

OBRIUM BRUNNEUM FAB., A SPECIES OF COLEOPTERA (LONGICORNIA) NEW TO THE BRITISH LIST.

BY P. HARWOOD AND L. G. COX.

On May 27th a single specimen of this interesting insect was beaten by Mr. P. Harwood from hawthorn-blossom near Wimborne, Dorset, and on June 1st a second example was obtained by sweeping in Sussex by Mr. L. G. Cox.

O. brunneum may be easily separated from *O. cantharinum* Linn. as under :—

O. cantharinum.	*O. brunneum.*
Size larger, 7—9 mm.	Size smaller, 4.5—6 mm.
Colour red-yellow.	Colour brown-yellow.
Antennae and legs more or less infuscate.	Antennae and legs distinctly paler than the body.
Space between eyes one eye-breadth.	Space between eyes as broad as, or in female much broader than, one eye.
Thorax almost smooth.	Thorax distinctly punctured.

Dr. Blair, to whom we are much indebted for confirming our identification, informs us that on the Continent *O. brunneum* appears to be the commoner species of the two, and to be attached to coniferous rather than deciduous trees. It is said also to inhabit mountainous districts.

Bournemouth.
June 17th, 1936.

BYTHINUS CLAVICORNIS PANZ., REINSTATED IN THE BRITISH LIST.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

Department of Entomology, British Museum (Natural History).

Pselaphus clavicornis Panzer, Faun. Germ., Heft 99, nr. 3 (1805-6); Reichenbach, Monog. Pselaph., p. 40, Pl. 1, f. 7 (1817). *Pselaphus glabricollis* Reichenbach, op. cit., p. 43, Pl. 1, f. 8. *Arcopagus glabricollis* Leach, Zool. Misc., 3, p. 83 (1817). *Arcopagus* *clavicornis* Leach, op. cit., **3**, p. 84; Denny, Monog. Pselaph., p. 25, Pl. 5, f. 2 (1825). *Arcopagus glabricollis* Denny, op. cit., p. 28, Pl. 5, f. 4; Curtis, Guide, p. 34 (1831). *Arcopagus clavicornis* Curtis, loc. cit.; Stephens, Ill. Brit. Ent., Mand. **5**, p. 93 (1832); Manual, p. 348 (1839). *Arcopagus glabricollis* Stephens, loc. cit. (1832); op. cit., p. 347 (1839). *Arcopagus clavicornis* Waterhouse, Cat. Brit. Col., p. 103 (1858). *Arcopagus ? glabricollis* Waterhouse, loc. cit. *Bythinus clavicornis* Waterhouse, Pock. Cat. Brit. Col., p. 35 (1861). *Bythinus glabricollis* Waterhouse, loc. cit. *Bythinus clavicornis* Crotch, Cat. Brit. Col., p. 30 (1863); second edition, p. 14 (1866). *Bythinus glabricollis* Crotch, loc. cit. (1863); loc. cit. (1866); Rye, Cat. Brit. Col., p. 270 (1866); Ent. Ann., p. 117 (1870). *Bythinus clavicornis* Rye, loc. cit. (1866): op. cit., p. 118 (1870). *Bryaxis clavicornis* Raffray, in Junk,, Col. Cat., pars **27**, p. 120 (1911). *Bythinus clavicornis* Winkler, Cat. Col. Palae., p. 461 (1925).

As pointed out by Dr. Schaum in 1847, the *Pselaphus glabricollis* Reichenbach is simply the female of *Pselaphus clavicornis* Panzer.

This species has been left out of the British list of Coleoptera ever since 1870; it does not appear in Dr. Sharp's British Catalogue (1871), nor in any of the later catalogues, and, very curiously, is not even mentioned by Fowler. Four specimens are contained in the British collection of Coleoptera at the Natural History Museum, two of them being from the Leachian collection, and two from the old B.M. collection, without further data.

One of the two specimens from Leach's collection bears a label 'glabricollis' in his own handwriting; nevertheless, it and the other three specimens are all males; they have been compared by Dr. Blair and myself with a ♂ from Reitter in the General Collection of the Museum. Leach writes of *glabricollis* as 'Prope Londinum rarissime. Dom. G. B. Sowerby; prope Bristol haud unfrequens. Dom. J. Miller'; and of *clavicornis* 'Habitat prope Swansea rarius. Dom. S. W. Millard.'

Of the two specimens from the old B.M. coll., Denny writes that 'one . . . was taken at Swansea by Mr. Millard, the other at Falmouth by Mr. Prideaux.' He says *clavicornis* is certainly the rarest species in the genus, and is also the largest. It is a large, shining dark brown insect, and quite distinct from all the other species. Rye incorrectly states that the two Leachian specimens are simply *B. bulbifer* Reich. He also says there is no difference in the antennae of the sexes in *clavicornis*, but this is not the case.

In the ♂ the first joint of the antenna is thickened, broader towards the apex, with sharp anterior angles, and the second joint carinate on the inner side, the carina ending in a little point or projection anteriorly. In the ♀ the first joint of the antennae is longer and parallel-sided and the second joint is simple.

One of the British Museum specimens has the inflated femora and thickened tibiae of *inflatipes* Reitt. (Naturg. Ins. Deutsche., III, 2, p. 72), now placed as a variety of *clavicornis*, with the anterior tibiae deeply notched before the apex on the inner side, much as in many Carabidae. It would appear that this example was taken by Rye to be the ♂, and the others ♀ ♀ ; but according to the antennal characters given above both forms are ♂ ♂.

I have seen a fifth specimen, also a ♂, from the Babington collection, kindly lent to me by Dr. Imms, taken by Babington at Westwick, Cambridgeshire.

It is evident that *B. clavicornis*, though a very rare species, should be reinstated in the British list.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
June 18th, 1936.

NOTES ON VARIATIONS IN THE TARSAL SEGMENTATION OF TWO STAPHYLINID BEETLES.

BY JAMES H. KEYS, F.R.E.S.

In the spring of 1935 I received from Mr. H. Donisthorpe a few small *Atheiae* from the New Forest. Amongst them there occurred a single specimen of *A.* (*Coprothassa*) *sordida* Marsh. which possessed a supernumerary segment to its anterior right tarsus, that is to say the tarsal formula of this insect was 5-5-5 instead of the normal number of 4-5-5. The left front tarsus was normal.

In view of the very close relationship of this beetle to individuals in the genus *Oxypoda*, whose normal tarsal formula is 5-5-5, it seemed almost certain to me that the abnormality in question was no accidental deformity, and I believed that if other similar specimens were sought for, they would be found. Accordingly I asked one or two correspondents to oblige me with any spare duplicates of *C. sordida* they might have in hand. I had a generous response, especially from Mr. E. Bullock of Killarney, who gave me some forty specimens. With this collection were included two rather small examples of *Oxypoda opaca* Gr. (put in accidentally I assume, as the insects are easily confused in casual observation). By most singular chance one of these *Oxypodae* had four segments only to each of its anterior tarsi, whereby its tarsal formula was 4-5-5 instead of the 5-5-5 which is proper to the genus. This aberration is therefore the converse of the case of the abnormal *C. sordida.* I also found a specimen of the 5-5-5 *sordida* in this Irish collection.

Amongst my own series of *sordida* one more 5-5-5 segmented example occurred. It was taken at Yelverton, S. Devon, many years ago. In all, I examined 128 of the *C. sordida* and two of the *Oxypoda,* and this small collection yielded three individuals with abnormal segmentation of the tarsi. Taking the first-mentioned specimen of *C. sordida* (from the New Forest) into account the result is four abnormalities in the 131 insects examined. Truly an astonishing proportion! Certainly I did not anticipate so easy a task. One abnormality in 200 specimens would have realised my expectation.

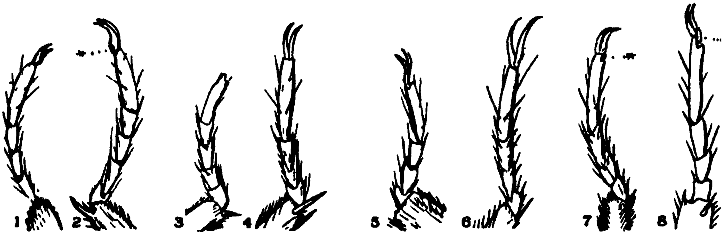
In the course of my survey I noticed great diversity in the general appearances of the various tarsi. Some were almost cylindrical in form (Fig. 6); others had well-formed segments with the joints more or less obvious; very few were readily determined, whilst a considerable number had to be viewed by transmitted light, which, however, was not always effectual and recourse had to be made to boiling in potash. On the apical tarsal segment situate near the basal third are two strong and divergent setae (Figs. 4, 6 and 7). In some individuals the muscles and tissues internal and below the pores of these setae apparently shrivel up and form an opaque ridge or fold. This fold I believe adds considerably to the difficulty of determining the joints in the tarsi of *sordida.* Moreover, there also occurs in some of these specimens a minute depression near the pores, capable, however, of reflecting light, and thus increasing the illusion of an actual joint.

The first segment was especially notable for its instability in form and size (Figs. 5, 6, 7), and as a whole the tarsi differ considerably in length. Fig. 5 represents a short example. Probably not the shortest I met with; but I measured several of them and computed the average variation in length as roughly up to 14 per cent.

At the bases of the claws in Figs. 2, 3 and 8 at the asterisk (*) a small chitinous nodule is shown, the approximate edges of the onychium being emarginate in accordance. I refrain from any suggestion as to their homology, but their occurrence in three specimens (two *Coprothassa* and one *Oxypoda*) is noteworthy as emphasizing the plasticity of these insects.

The explanation of the diagrams below is as follows :—Fig. 1 : four-segmented tarsus *O. opaca*. Fig. 2 : normal form. Fig. 3 : five-segmented tarsus *C. sordida*. Fig. 4 : normal form. Figs. 5-8 : other abnormal tarsi of *C. sordida* (see above).

The figures were sketched with the camera lucida × 210 and then reduced rather more than one-third. = magnification about × 70.



In Fig. 1 it will be noticed that no apical spines to the tibia are shown. Apparently they are replaced by a series of blunt abbreviated coarse spines or setae, and the apex of the side of the tibia below the first tarsal joint is a little produced in a lobe-like extension—not shown in the diagram. The other tibia of this insect is armed with the usual apical spines and seems otherwise quite perfectly formed. In mounting it in balsam the first tarsal segment became broken diagonally almost into two parts, so that it was not so suitable for depicting as the one shown. It is a useful specimen, however, mounted beside its fellow.

I am grieved to say that by further and more serious accidents I have lost both my abnormal specimens of *C. sordida*—destroyed in the potash.

The 5-5-5 example of *C. sordida* from the New Forest, has been given by Mr. H. Donisthorpe to the Natural History Museum, South Kensington, and with the consent of Mr. Bullock I am sending the 4-5-5 *O. opaca* to accompany it.

I am indebted to my late lamented correspondent, Mr. C. E. Stott, for specimens of *sordida,* and my thanks for contributions are hereby expressed to Mr. E. Bullock, Mr. P. Harwood and my local colleague, Mr. A. V. Mitchell.

PS.—I think it should be mentioned that of the species of *Oxypoda* the one which *C. sordida* most closely resembles is *vittata* Märk. *O. opaca* is a darker and larger insect.

9, Hillside Avenue, Mutley, Plymouth.
May, 1936.

A NEW SPECIES OF *MELITTOMMA* (COL. LYMEXYLONIDAE) FROM INDIA.

BY K. G. BLAIR, D.SC., F.R.E.S.

The following new species of *Melittomma* from India has been sent to me for description by Mr. J. C. M. Gardner, who is describing its early stages.

Melittomma albitarsis sp.n.

♂. Small, elongate, subcylindrical, fusco-testaceous, with tarsi whitish. Head as wide as elytra at shoulders, a little wider than prothorax; frons triangular with pubescence sloping forwards; eyes very large, contiguous for some distance in front, clothed with erect hairs; antennae reaching a little beyond middle of thorax, last joint elongate-pyriform, nearly as long as the three preceding together; maxillary palpi stout, the last joint black, enlarged and branched, forming a complicated organ as usual in this genus. Prothorax about half as long again as wide, widest across anterior angles, sides straight, slightly converging to base; anterior margin produced but truncate in middle, forming almost half a regular hexagon; surface raised along middle, sloping towards sides, closely and finely granulate in middle, near anterior angles with large, shallow, somewhat umbilicate punctures; pubescence sloping obliquely outwards and backwards. Scutellum slightly elongate, subtruncate at apex, pubescence denser than on surrounding areas. Elytra nearly three times as long as thorax, each feebly spatulate towards apex and separately obtusely acuminate. Surface finely, moderately closely granulate; pubescence sloping backwards. Wings ample, projecting when folded a little beyond apex of abdomen. Pygidium subtriangular, bluntly rounded at apex, exposed beyond elytra. Tarsi slender, longer than tibiae, basal joint of intermediate and posterior tarsi as long as the two preceding joints together, first to fourth decreasing in length, fifth about as long as second. Length 5½-6½ mm.

Habitat. BENGAL, Kurseong, 3rd-12th May, 1936, 4 examples ex *Bombax malabaricum* (C. F. C. Beeson).

Though apparently the first of its genus to be recorded from India, the British Museum possesses specimens from Sylhet and Ceylon referable probably to *M. javanicum* Chevr. Compared with this, the new species is much smaller, the thorax differently sculptured, the elytra with hardly any indications of longitudinal raised lines, and individually almost symmetrically though bluntly acuminate at tip. Unfortunately the specimens sent are all males, and show little indication of the great variability in size usually exhibited by the members of this family.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
June 18th, 1934.

RESULTS OF THE OXFORD UNIVERSITY EXPEDITION TO BORNEO, 1932. PASSALIDAE (COLEOPTERA).

BY W. D. HINCKS, M.P.S., F.R.E.S.

One hundred and six examples of Passalidae were collected by Dr. B. M. Hobby and Mr. A. W. Moore during the 1932 Oxford University Expedition to Sarawak. Although only nine species are contained in the collection, and none of them are new to science, it has been thought useful to record the material on account of the locality and biological data attached to the specimens.

A check list of the recorded Bornean Passalidae is included in this paper, whilst descriptions and determination tables of most of these have already been published by Gravely (1, 2). The distribution and bibliographical details will be found summarised in the recently published catalogue of the family (3).

Thanks are due to Mr. G. J. Arrow and Dr. Hobby for the opportunity of examining and reporting on the collection.

LOCALITIES.

In order to avoid repetition the localities from which Passalid material was obtained by the Expedition are numbered as indicated below. All the specimens are labelled as having been collected by B. M. Hobby and A. W. Moore, but several in addition have a label ' Native Collected ':

(1) SARAWAK : R. Kapah, trib. of R. Tinjar.
(2) SARAWAK : Mt. Kalulong.
(3) SARAWAK : Mt. Kalulong, Long Miwah.
(4) SARAWAK : Mt. Kalulong, Kalulong Dist.
(5) SARAWAK : Foot of Mt. Dulit, junction of rivers Tinjar and Lejok.
(6) SARAWAK : Mt. Dulit, R. Koyan, 2,500 ft. Primary forest.

LIST OF SPECIES OBTAINED BY THE EXPEDITION.

Subfam. AULACOCYCLINAE.

1. *Comacupes stoliczkae* Gravely, Mem. Indian Mus. **3**, 1914, p. 206, 268, 318, pl. xi, f. 3-3A — Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 7.

3 exs. (6), 18.xi.1932, 20.xi.1932 (in rotting felled timber in Primitive forest).

This species was confused by Kaup (4) with *cylindraceus* (Perty). Gravely (1) has already pointed out the distinguishing characters.

C. stoliczkae is recorded from the Malay Peninsula and from the Greater Sunda Islands.

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* For a general account of this expedition see T. H. Harrisson, Geographical Journal, **86**, 1935, pp. 386—410.

Subfam. MACROLININAE.

2. *Ophrygonius wallacei* Kuwert, Nov. Zool. **5**, 1898, p. 334 (*Heterochilus*) — Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 81.
   11 exs. (1), 3.x.1932 (under the bark of dead trees in rotting felled timber in primitive forest; cocoon of matted soil and woody strands).

This species is not yet recorded from Java, otherwise its distribution is similar to that of *C. stoliczkae*.

3. *Aceraius borneanus* Kaup, Berl. Ent. Zeitschr. **15**, Suppl. 1871, p. 52 — Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 81.
   1 ex. (1), 23.x.1932 (in rotting felled timber). 6 exs. (3), 2.xi.1932. 11 exs. (5), 11.viii.1932 (in rotting felled timber in small clearing in old secondary forest), 17.viii.1932 (in timber in state of fungoid decay, old secondary forest), 31.viii.1932 (on bark of felled tree), 10.ix.1932.

An abundant species in Borneo and widely distributed over the Malay Peninsula, Java, Sumatra and the neighbouring islands.

4. *Aceraius grandis* Burm., Handb. Ent. **5**, 1847, p. 463 (*Passalus*)— Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 82.
   1 ex. (5), 9.ix.1932 ('Trap 1'). 1 ex. (6), 18.xi.1932 (primitive forest, rotten wood).

A common and well known species the typical form of which is widely distributed throughout the Malay Peninsula, Java, Sumatra, Borneo and the surrounding islands. The subspecies *hirsutus* Kuw. 1891 replaces the type on the Asiatic mainland and in Formosa and the South Palawan Islands. It is possible that another subspecies (*chinensis* Kuw. 1898) exists in the Palaearctic region in China but no further specimens than those examined by Kuwert have yet been reported.

5. *Aceraius laevicollis* Illiger in Wiedem. Archiv Zool. **1**, 1800, p. 103 (*Passalus*) — Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 83.
   5 exs. (5), 23.viii.1932, 6.ix.1932, 2.x.1932 (clearing for Padi, on bark of felled tree).

The distribution of this species is essentially the same as that of *A. grandis grandis* but extends to the South Palawan Islands and the Philippines. It is also recorded from the Celebes, but almost certainly in error.

Subfam. LEPTAULACINAE.

6. *Leptaulax bicolor* F., Syst. Eleuth. **2**, 1801, p. 256 (*Passalus*)— Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 100.

25 exs. (1), 2.x.1932 (clearing for Padi, on bark of felled trees), 3.x.1932 (shady ravine, primitive forest; cocoon of matted soil and woody strands), 24.x.1932 (on bark of felled timber, near stream in primitive forest).

1 ex. (2), 5.xi.1932 (old secondary forest); 2 exs. (3), 2.xi.1932.

20 exs. (5), 9.viii.1932 (under bark of dead tree), 11.viii.1932 (in rotting felled timber, small clearing in old secondary forest), 18.viii.1932 (in rotting felled timber, Tapioca clearing; native name 'Talun'), 9.ix.1932, 13.ix.1932 ('Trap 5').

A dominant and very widely distributed species from India and Ceylon to Australia. The present series is not particularly variable and is quite typical. The range of size is 16.5—21.5 mms.

7. *Leptaulax cyclotaenius* Kuwert, Deutsche Ent. Zeitschr. **1891**, p. 188—Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 102.

1 ex. (4), 1.xi.1932 (on boulders in torrent, primitive forest).

10 exs. (5), 9.viii.1932 (under bark of felled camphor tree), 10.ix.1932 (on bark of felled tree in old secondary forest), 13.ix.1932 ('Trap 5').

Widely distributed on the Asiatic mainland from the Eastern Himalayas to Indo-China. It occurs in the Malay Peninsula and the Greater Sunda Islands.

The present series measures 12-16 mms. in length and some of the specimens are not quite typical in having the lateral punctures of the elytra partly dull and worn-looking. This feature is probably due to wear, and should not be confused with the dull and worn-looking punctures in *L. humerosus* and its allies, of which species this is a constant characteristic.

8. *Leptaulax dentatus* F., Ent. Syst. I, **2**, 1792, p. 241 (*Passalus*)—Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 102.

2 exs. (2), 1,800 ft., 4.xi.1932 (in rotting felled timber in primitive forest). 2 exs. (5), 23.viii.1932 (at light in house), 4.ix.1932 (secondary forest).

L. dentatus is as widely distributed as *L. bicolor* and equally dominant. The four specimens contained in the present collection vary somewhat. The size ranges from 20 to 27 mms.

9. *Leptaulax planus* Illiger in Wiedem. Archiv Zool. **1**, 1800, p. 104 (*Passalus*)—Hincks & Dibb, Coleopt. Cat. pars 142, 1935, p. 104.

1 ex. (1), 3.x.1932 (shady ravine in primitive forest; cocoon of matted soil and woody strands). 1 ex. (3), 2.xi.1932. 1 ex. (5), 5.x.1932 (old secondary forest).

This small species is readily recognised by its size, narrow form and by having the abdominal sterna completely covered with large shallow punctures. It is common in Borneo and occurs in Burma, Siam, Malay Peninsula, Sumatra, Java, and is also said to be found in the Celebes.

The three examples recorded above measure 12.5 mms. in length.

CHECK LIST OF BORNEAN PASSALIDAE.

AULACOCYCLINAE.

1. *Comacupes cavicornis* (Kaup, 1868).
2. ,, *cylindraceus* (Perty, 1831).
3. ,, *foveicollis* Kuwert, 1891.
4. ,, *stoliczkae* Gravely, 1914.
5. *Taeniocerus bicanthatus* (Perch., 1841).
6. ,, *bicuspis* (Kaup, 1868).
7. ,, *platypus* (Kaup, 1868).
8. ,, *pygmaeus* (Kaup, 1868).
9. *Aulacocyclus aruensis* Kuwert, 1891.
10. ,, *perlatus* Kaup, 1868. ?

MACROLININAE.

11. *Macrolinus latipennis* (Perch., 1841).
12. *Ophrygonius aequidens* (Gravely, 1914).
13. ,, *inaequalis* (Burm., 1847).
14. ,, *singapurae* Gravely, 1914.
15. ,, *wallacei* (Kuwert, 1898).
16. *Aceraius alutaceosternus* Kuwert, 1898.
17. ,, *borneanus* Kaup, 1871.
18. ,, *grandis* (Burm., 1847).
19. ,, *illegalis* Kuwert, 1891.
20. ,, *laevicollis* (Ill., 1800).
21. ,, *laniger* Zang, 1905.
22. ,, *möschleri* Kuwert, 1891.
23. ,, *oculidens* Zang, 1905.
24. ,, *perakensis* Kuwert, 1898.
25. ,, *pilifer* (Perch., 1835).
26. ,, *tricornis* Zang, 1903.
27. *Pelopides burmeisteri* (Kaup, 1868).
28. ,, *monticulosus* (Smith, 1852).
29. ,, *symmetricus* (Zang, 1904).
30. *Labienus ptox* (Kaup, 1868). ?

LEPTAULACINAE.

31. *Leptaulax anibarbis* Kuwert, 1898.
32. ,, *bicolor* (F., 1801).
33. ,, *cyclotaenius* Kuwert, 1891.
34. ,, *dentatus* (F., 1792).
35. ,, *humerosus* Kuwert, 1891.
36. ,, *planus* (Ill., 1800).

No. 10 is probably and No. 30 is almost certainly wrongly recorded from Borneo.

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'Sudest,' 46 Gipton Wood Avenue,
Harehills, Leeds 8.
June, 1936.

THE PARASITES OF BRITISH BIRDS AND MAMMALS.

IX. A BIBLIOGRAPHY OF THE PAPERS CONTAINING RECORDS OF MALLOPHAGA (BITING-LICE) FROM BIRDS AND MAMMALS.

BY GORDON B. THOMPSON
(Department of Entomology, British Museum (Nat. Hist)).

Since the only published records of Mallophaga parasitic on British birds and mammals are those contained in Denny's Monograph and in papers by Evans, Waterston, Bagnall, etc., it is not surprising to find that there is a vast number of these parasites which have been collected and recorded in other parts of the world from hosts which are either normal inhabitants or annual visitors to the British Isles but have not been recorded as being taken here.

It is my intention to publish additional records in the near future on the basis of material which is continually being sent to me. Before proceeding to publish these additional records I have thought it best to compile a bibliography * of the books and papers containing the previous records as many of these are not referred to in the Zoological Record. This bibliography is presented below.

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* This bibliography does not contain papers dealing solely with Mallophaga of domestic birds or mammals.

The papers of each author and, as far as possible, the authors' names are arranged in chronological order. The complete title of each paper is given together with the abbreviation of the periodical in which it appeared. The abbreviations of the periodicals are given in accordance with the 'World List of Scientific Periodicals' (1934).

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British Museum (Natural History),
Cromwell Road, London, S.W.7.
May 20th, 1936.

A request for British material of the genus Odynerus (Hymenoptera).—I have in preparation an account of the British species of *Odynerus,* including as full a description as possible of their variation, distribution, and habits, and am particularly anxious to view all available Scottish and Irish material. Would, therefore, Hymenopterists who may have in their possession any such material, no matter how slight, be good enough to communicate with me?—H. Parry Jones, F.R.E.S., Public Natural History Museum, Wollaton Hall, Nottingham: *May 4th,* 1936.

A note on the behaviour of New Zealand birds towards the Cinnabar moth (Tyria jacobaeae L.).—An interesting article by Ewen Cameron (1935, J. Ecology **23**, pp. 265-322) on the control of Ragwort and other foreign weeds which have become pests in New Zealand, resulted in my writing to Dr. D. Miller, Chief of the Entomological Department of the Cawthron Institute, to ask if there were any observations as to the behaviour of insectivores in New Zealand to the Cinnabar moth (*Tyria jacobaeae* L.) which had been introduced to cope with the Ragwort.

According to Cameron, who had studied the enemies of this insect in England, the effect of predators is felt only in the pupal stage, since the black and yellow larvae are distasteful to birds: the mole is considered to be the most important predator, and at least 60 per cent. of the insects are destroyed as pupae. In response to enquiry Dr. Cameron kindly wrote to me, 'I have never observed the larvae to be attacked by birds, although I have been in the field a great deal during the season when larvae are plentiful. When I tried to feed the pupae to a large flock of game birds, chiefly pheasants, it was with difficulty that I could get them to eat any at all.'

The following observations which Mr. J. M. Kelsey of the Cawthron Institute kindly sent me, are therefore of interest.

'*12th May,* 1936.

Dear Sir,

Dr. Miller has asked me to supply you with any information we have available in regard to New Zealand birds in relation to *Tyria jacobaeae.*

On two occasions the common house-sparrow, *Passer domesticus,* was seen eating adult moths. The first case was of a sparrow eating a moth on the ground, and the second of a sparrow capturing the moth while both were in flight, the bird retiring to a nearby tree to devour its capture.

To secure supplies of *Tyria* eggs for distribution it was necessary to grow plots of ragwort in the Institute grounds, the adult moths being enclosed in muslin bags stretched on wire frames and placed over ragwort plants.

From time to time it was noted that some bird had been robbing the muslin cages of the adult moths, and though no one has actually seen the robbery taking place, numbers of small round holes were seen with pieces of moth-wings stuck in the threads of muslin surrounding them. It is not known what bird was responsible, but numbers of the common house-sparrow were frequently observed perched on the cages and on the ground near them.

In regard to birds attacking the caterpillars. I cannot say definitely that the bird was the same one each year, but during the years 1931 to 1933 a shining cuckoo, *Lamprococcyx lucidus,* appeared each spring in the plots to feed on the brightly coloured *Tyria* caterpillars. There was a low post in one of the beds on which the bird used to perch and from which it flew down to secure a caterpillar which it brought back to the post and devoured. Towards noon the bird was usually found on the ground in the plots too gorged with caterpillars to bother about returning to the post, and taking to flight only when a worker approached quite close to it, when it usually flew about ten feet away to settle again. On several occasions larvae were seen hanging from one side of the beak, the bird being unable to swallow any more, though making heroic attempts to do so.

One or two farmers on whose properties the insect had been liberated took considerable interest in the development of the caterpillars, and were surprised at the sudden disappearance of these over wide areas; the only reason they could give for this was that they had been eaten by the imported starling, *Sturnus vulgaris,* large numbers of which appeared in the areas where the insect had been liberated. None of these observers actually saw the starlings eating the caterpillars, but since the latter were present in various stages of development prior to the arrival of the birds, and as they could find practically no caterpillars on the departure of the birds after a few days, they concluded that these were responsible.

Apart from the cuckoo no native birds have been recorded as feeding on either larvae or adults of *Tyria jacobaeae.*

Yours faithfully,

J. M. KELSEY, *Assistant Entomologist.'*

The closing sentence of Mr. Kelsey's letter is of considerable value, for it once again adduces evidence of the peculiarities of cuckoos. The cuckoo of the country is known to feed upon hairy and other caterpillars disliked by other birds (see, for example, 1935, Proc. R. Ent. Soc. London, **10**, p. 81).

But the fact that two species of British birds introduced into New Zealand appear there to attack freely an insect which they are not known to attack in their native country is of quite as much interest, and suggests that further enquiry would be valuable,.—G. D. HALE CARPENTER, Hope Professor, Dept. of Entomology, University Museum, Oxford: *June 19th,* 1936.

Malachius marginellus Ol. at Oxford.—While sweeping in the Summertown meadows in the late afternoon of June 16th, I was fortunate enough to 'strike a patch' of this pretty and local Malacoderm beetle, hitherto known from the district by a very few sporadic examples, in the corner of a field within less than a quarter of a mile from my house. A few minutes' work with the net gave me a good series of the *Malachius,* which appeared to be practically confined to a space of not more than twenty yards in extent. The vegetation here consisted almost entirely of the ordinary meadow grasses, of which the Rye-grass, *Lolium perenne,* was evidently the kind most favoured by the beetle, as the majority of my specimens were obtained where this grass was predominant. *M. marginellus* is much more active than its more common congeners, as it takes to wing with the utmost readiness and too often escapes if not arrested directly it emerges from the contents of the sweeping-net.—JAMES J. WALKER, Oxford: *June 19th,* 1936.

The Ants of the Azores: a Correction.—In Mr. Donisthorpe's paper (June number, pp. 130-133), the sign ♀ should be replaced throughout by that for 'worker' (☿), except under *Ponera eduardi,* after 'Sete Cidades'; under *Monomorium carbonarium*; and under *Acanthomyops niger,* after 'Magdalena.' In these three cases both queens and workers were taken.—EDS.

Society.

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held on Wednesday, May 20th, 1936, Mr. R. W. Lloyd in the Chair. The meeting was called for 7.30 p.m. at 1, 5 and 6 Albany, Picadilly, W.1.

Members present in addition to the Chairman: Mr. H. Donisthorpe, Mr. H. Willoughby Ellis, Mr. Jas. E. Collin, Dr. Harry Eltringham, Mr. W. J. Kaye. Visitors present: Dr. K. G. Blair, Dr. Karl Jordan, Sir Guy A. K. Marshall, Dr. S. A. Neave, Capt. N. D. Riley, Dr. Hugh Scott.

Dinner was served at 8 o'clock, and on retiring the Chairman showed and explained his collection of Alpine Lepidoptera. The guests then dispersed about the various apartments which are rich in articles of Vertu and Works of Art. Only a comparatively small portion could be seen during the evening, but the fine collection of prints and old water-colour drawings presented an opportunity of seeing what is probably a unique collection brought together in a private residence.

The happy party remained till the later hours of the evening, and many hopes were expressed that a further opportunity may occur to enjoy even more fully the rare and beautiful things, which owing to lack of time, could only be so inadequately appreciated.— H. WILLOUGHBY ELLIS, *Hon. Secretary.*

THE BROWN LACEWING FLIES (HEMEROBIIDAE): THEIR IMPORTANCE AS CONTROLS OF *ADELGES COOLEYI* GILLETTE.

BY W. B. R. LAIDLAW, D.SC., B.SC. (FOR.), F.R.E.S.

PLATE III.

HEMEROBIIDAE (NEUROPTERA): 1. GENERAL CHARACTERS.

Closely allied to the Chrysopidae or Green Lacewing Flies, of which *Chrysopa dorsalis* is the only conifer-inhabiting species, the Brown Lacewing Flies are smaller, the wings brown-veined, never green, more or less spotted with brown and variably iridescent according to species or sex. The larvae live on Aphids and *Adelges*, having suctorial piercing mouth parts (see Plate III, Figs. 7, 8 and 9); but unlike the Chrysopidae they do not cover themselves with Aphid remains. They spin a stout silken cocoon, usually under dry bark, where the larvae hibernate, pupating in the spring. The eggs are simple without pedicels, the latter being replaced by an apical knob (Plate III, Figs. 1 and 3).

2. OBSERVATIONS.

1. *Boriomyia subnebulosa* Steph. was taken on *Adelges* infested Douglas Fir at Pitfour, Aberdeenshire, on 6th May, 1930; others were seen on infested Douglas Fir at Craibstone, Aberdeenshire.

2. *Hemerobius stigma* Steph. Two males and a female were beaten from a ten-year-old Douglas Fir at Hazlehead, Aberdeen, on 1st April, 1933.

The results of cage experiments may be conveniently tabulated as follows :—

Abstract of Life-History Observations.

	Cage No. 3.		*Cage 1A.*		*Cage 3A.*	
Stage.	*Date.*	*Duration in days.*	*Date.*	*Duration in days.*	*Date.*	*Duration in days.*
Egg laid	20th April	11 days	16th May	9 days	16th May	10 days
Hatched	1st May		26th May		25th May	
Larva	1st May	30 days	26th May	27 days	25th May	31 days
Full fed	1st June		21st June		24th June	
Prepupa	1st June	8 days	21st June	8 days	24th June	8 days
	8th June		(29th June)		(2nd July)	
Pupa	8th June	10 days	(29th June)	10 days	(2nd July)	10 days
	(18th June)		(9th July)		(12th July)	

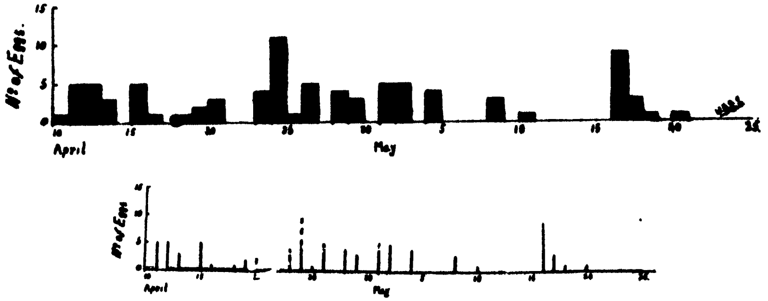
Adelges eaten : = 3000 = 2950

Average egg stage ... ... Cage 4 = 11 days.

(For details of cage observations see appendix)

3. Life-History.

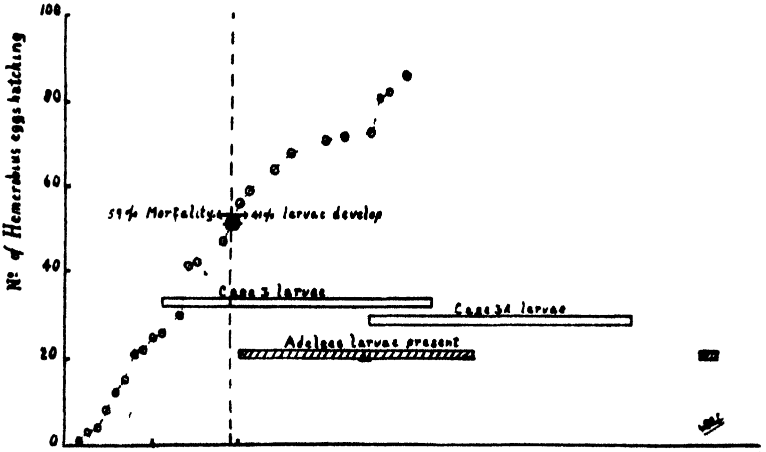
1. *B. subnebulosa* (Plate III, Fig. 2). The adults appear earlier than the true Lacewings, from April onwards, and lay eggs. The males soon disappear, and the larvae feed on *Adelges* or Aphids, reaching maturity in three instars. They spin a silken cocoon, pupating under dry bark, etc., to emerge as adults. Mr. K. J. Morton tells me that *Boriomyia subnebulosa* has two generations. The spring brood in April and May gives a generation which reaches the adult stage in August and September. The generation produced by these, according to my own observations, feed up, spin cocoons and hibernate as prepupae, pupating during March to emerge in April as adults.



Graph 1.—Egg Laying Figures for *H. stigma.*

2. *H. stigma.** The adults appear about the beginning of April and pair. Egg-laying commences in about two weeks. The eggs are laid on the Douglas Fir needles (Plate III, Fig. 3). One egg was

taken in the field on 19th April, the first laid in the laboratory was on 10th April; 1 to 11 eggs are laid daily. These hatch in about 11 days, the period tending to become less as the season advances. (The maximum period was 16 days, between 12th April and 28th April; the minimum period 8 days, between 1st May and 8th May.) The female laid 86 eggs altogether, and died on 22nd May. The males lived from 1st April till 18th April and 12th June respectively, the solitary specimen dying first. The first egg laid in the laboratory on 10th April hatched on the 22nd April. At the beginning, larval mortality was high. The young larvae feed normally on newly-hatched *Adelges* nymphs, and these did not start to appear until 10th May, and were not really common until the fourth week in May. In the absence of their normal food they made attempts on the half-mature *Adelges*; some of them managed to survive on these, but the majority of *Adelges* were mature at the time and a few beginning to lay eggs. The cuticle of these *Adelges* was too tough for the *Hemerobius* larvae to pierce. The few that managed to do so were unable to extricate themselves. Others attempted to pierce the eggs with the same result. The waxy filaments of the adults and those surrounding the eggs of the *Adelges* were a constant obstruction to the young *Hemerobius* larvae. One young larva was seen feeding on the drop of fluid excreted at the anus by a newly moulted half-mature *Adelges*. This globule soon disappeared, and in three hours the larva had the jaws plunged right up the anus, and the *Adelges* was half sucked dry. After two days,



GRAPH 2.—Egg Hatching of *H. stigma*. Showing periods of presence and absence of food supply for first instar larvae.

however, it was still there, dead, having been unable to get free from the shrunken corpse of the *Adelges* (see Graph 2).

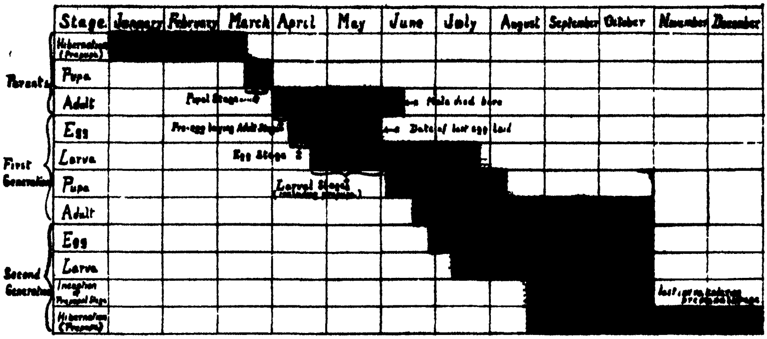
The larvae have a strong dislike of light, and hide away in the daytime under withered bud-scales or anywhere affording concealment. When older, they seem to be able to survive on maturing *Adelges* nymphs and on eggs, but their normal diet is newly-hatched nymphs; these they spring at and snap with their jaws, finally sucking them dry.

When disturbed, they are very active, running about rapidly in search of shelter. These larvae at none of their stages attempted concealment by covering themselves with débris after the manner of Chrysopid larvae. The length of the first instar is 7-8 days. There are three instars, and the larva is mature in about 30 days. Four days are spent in spinning the cocoon, which is spun from the anus, and after lying quiescent for about five days the larva pupates. The adults emerge within two weeks. Mr. K. J. Morton tells me that two generations normally occur. Larvae of the second generation are full-fed in the autumn, spin cocoons and lie over winter in the prepupal state after the manner of Sawflies. In the spring, they pupate and eventually the pupae break free of the cocoons, before the adults emerge. The adults have no dietary difficulties, feeding equally readily on all stages of the *Adelges*. If anything, they prefer the eggs and tend to ignore the newly-hatched nymphs. They feed during the daytime and appear to have a fairly fixed routine. They feed actively during the morning, rest early in the afternoon, lay eggs and feed till evening. Another egg-laying period occurs between evening and 9 a.m. They dislike drought, and drink greedily from drops of water.

The pair kept fed together peaceably on the whole, but the female resented disturbance during meals. On one occasion, the male touched her with his antennae. At this she stopped feeding and made a movement towards him; finally she chased him right down the branch, returned to her meal, finished it, and methodically cleaned herself like a cat, with her front legs over her head, and drawing her antennae through them, finally nibbling her claws and tarsi clean.

On 20th June *Hemerobius* eggs similar to those of *H. stigma* were taken on European larch, with *A. laricis*.

The Life-History chart shows the periods through which the different stages occur. The actual length of egg, larval and pupal stages are also shown. The second chart shows the periodicity of egg-laying, figures being obtained from one female.



Graph 3.—*Hemerobius stigma.* Life History Periods.

4. DESCRIPTIONS.

1. *Boriomyia subnebulosa,* female (dried specimen) (Plate III, Figs. 11 and 11A). Colour: ochreous-yellow, antennal joints broadly at the apex, apical joints entirely, infuscate, frons dark pitchy, clypeus and labrum ochreous to pitchy, palpi black, apical joints pale. Vertex of head and middle line pitchy black, pronotum broadly at sides and narrow middle line, sides of meso- and metanotum, broadly to extreme lateral angles of scutellum, and apical abdominal segment above, black.

Thorax centrally and first abdominal segment more or less infuscate; front femora slightly above, and tibiae darker and more broadly, tarsi more or less, infuscate; second tibiae broadly infuscate above; third tibiae slightly infuscate apically, and all apical tarsal joints black.

Wings. Fore wings slightly clouded and iridescent, with dark brownish blotches towards lower margin of wings, becoming more distinct towards base; hind wings clear, slightly infuscate along costal margin. Length 6 mm. × 20 mm. expanse.

The male (dried specimen) is smaller, blacker, especially the abdomen, the wings with a bluish smoky tinge, more highly iridescent and with darker veins. Length 6 mm. × 17-18 mm. expanse.

2. ***Hemerobius stigma,*** adult, has a quite distinct appearance from that of ***B. subnebulosa.*** It is smaller, and its general tawny appearance contrasts strongly with the bluish-grey appearance of the wings of the other. The reddish linear spot on the upper edge of the wings is usually quite distinctive.

Colour. Head, thorax and abdomen reddish-brown to pitchy, especially in the male. In the female a testaceous line runs centrally from the epicranium to the metanotum, with the central portions of the thorax above, especially the meso- and meta-scutellum, also testaceous; in the male the pale central line is confined to the head and pronotum, the whole of the meso- and meta-scutellum is testaceous. Abdomen pitchy, apical segments testaceous in male.

Face. Antennal joints apically broadly in male, narrowly in female, and whole of joints in apical third of antennae, fuscous; in female epicranium and sides of face pitchy, frons, clypeus and labrum more or less testaceous—black above base of mandibles, and a black central spot beneath antennae, palpi fuscous, apical joint pitchy; in the male the face is pitchy, frons, clypeus and labrum centrally dark testaceous; palpi pitchy.

Legs more or less fuscous to pitchy, testaceous at base; hind tibiae testaceous, apical joint of all tarsi pitchy.

Wings tawny, with a more or less clearly defined reddish stigmatic mark subapically on front margin, more distinct on the unmottled hind wings. Fore wings with two irregular rows of spots sub-parallel with and approximating to the lower and outer margins. All wing veins and margins with regular fine hairs or bristles.

Egg. The egg is about 0.75 mm. long, greenish when first laid, with regular longitudinal white dots, arranged in cylindrical bands; elongate-oval in shape. The apex terminates in a short, round, truncate knob (see Plate III, fig. 3). On the eighth day the egg is bright yellow, and on the ninth shows tinges of brown. Two or three days before hatching segmentation of the coiled larva is just visible.

Larva. When newly hatched the larva is the long, active, narrow larva typical of the campodeiform type, measuring 1.5 mm., it is yellowish-testaceous in colour and transparent. The full-grown larva is opaque, dirty-white, with two wide, dark dorsal bands, reddish to purplish in colour, running down the body outside the middle line (the head and the legs are pitchy). It measures 8 mm. in length, is widest about the centre and tapers strongly to the head and tail. (Plate III, Figs. 3-8).

Prepupa. The full-grown larva spins a fine silken cocoon from the anus. It is two-chambered, the outer wall consisting of a coarser, wider-meshed structure, surrounding the finer-spun inner wall through which the resting larva may be seen. In this it rests for four to seven days before pupation in the first generation, all winter in the second; with the head tucked down between the legs. (See Plate III, Fig. 10).

5. DISTRIBUTION.

Boriomyia subnebulosa is one of our commonest Hemerobiids. In Aberdeenshire, particularly in 1933, I found *Hemerobius stigma* generally abundant on conifers.

6. HABITAT.

From my observations made in Aberdeenshire, *H. stigma* appears to be the commonest of the conifer-inhabiting species. I have taken it in association with *A. cooleyi* on Douglas Fir, pine aphis (*Lachnus pini*) on Scots Pine, *Adelges viridis* on Larch, and *Neomyzaphis abietina* on Norway and Sitka spruce. They prefer moist, sheltered places in woods where their food abounds.

Other conifer-inhabiting species are *H. simulans* Walk. (*orotypus* Wall.), *H. pini* Steph., *H. atrifrons* McLach., *H. limbatellus* Zett. (rare) and *H. nitidulus* Fab.

7. ABUNDANCE AND INFLUENCING FACTORS.

Though several Brown Lacewings are common here and in Britain generally, they are never so conspicuous as the Coccinellid *Aphidecta obliterata* L. as an *Adelges* enemy. Essentially a northern group, they are much commoner than the Chrysopidae in Scotland, thriving in colder conditions than the Chrysopidae. Food is probably on this account the most important factor controlling their numbers. The incomplete synchronisation of the life-history of this species with that of *A. cooleyi* is a case in point, high mortality occurring early in the year among the larvae for lack of proper food (see Graph 3).

8. DEGREE OF EFFICIENCY.

In view of its normally fairly limited numbers in comparison with *Aphidecta*, it must be regarded as being second in importance as a natural control. Artificially encouraged, it might well prove an efficient aid against *Adelges*. Taking into account that six species are definitely associated with conifer-feeding hosts, their chance of success is considerable.

The following figures give an idea of the potential efficiency of *H. stigma* as a control of *A. cooleyi* :—

Number of eggs laid = 86.
Number of *Adelges* eaten by one female (1st April to 23rd May) ... ... = 17,588
Number of *Adelges* eaten by one male (1st April to 12th June) ... ... = 13,594
Number of *Adelges* eaten by one larva (approximately) ... ... = 3,000

Thus in one year a pair of *H. stigma* and their progeny will account for the following :—

Number of *Adelges* eaten by female ... = 17,600
Number of *Adelges* eaten by male ... = 13,500

First Generation.

Number of eggs laid by female = 86 ; (and mortality = 50%).
Therefore successful larvae = 35.
Number of *Adelges* eaten by first generation larvae : 35 × 3,000 ... ... = 105,000
Approximate number of females in first generation = 18.
Number of *Adelges* eaten by first generation adult males : 17 × 13,500 ... ... = 229,500
Number of *Adelges* eaten by first generation adult females : 18 × 17,600 ... = 316,800

Second Generation.

Number of eggs laid by first generation females : 86 × 18.
Less 26 (lower mortality in summer) = 60 × 18 = 1,080 successful larvae.

Number of *Adelges* eaten by second generation
larvae : 1,080 × 3,000 ... ... = 3,240,000
Hibernation after this point.

Number of *Adelges* devoured by *H. stigma* in one
year by two parents and their offspring = 4,122,400
Or approximately four millions.

9. NATURAL ENEMIES.

Few natural enemies of the Chrysopidae or Hemerobiidae are known; spiders, insectivorous birds and such predatory insects as Dragonflies prey on them. Morley notes *Ephialtes gracilis* Grav. (Ichn. Brit., Vol. III, p. 42).

APPENDIX.

Cage 1. Male and female. For egg-laying and feeding figures and length of life of adult.
Cage 2. Male. For length of life and feeding figures.
Cage 3. For egg development and larval periods.
Cage 4. Eggs. For egg stage.
Cage 4X. Larvae. For life history.

New Series. 1A, 2A, 3A, 4A and 5A. For life history and larval feeding figures.

Results were as follows :—

CAGE 1 (male and female adult).

April 1st. Entered.
,, 10th. First egg laid. Adults feed on half-mature *Adelges*, eggs and newly hatched larvae.
May 23rd. Female dead. 86 eggs laid. 26,383 *Adelges* eaten by ♂ and ♀.
June 12th. Male dead. 4,500 *Adelges* eaten by male since 23rd May.
,, — The female devoured about two-thirds of the total figure on May 23rd. = 17,588 *Adelges* from April 1st—May 23rd.
The male devoured one-third of the total on May 23rd + 4,500. = 13,594 *Adelges* from April 1st—June 12th.

CAGE 2 (one male).

April 1st. Entered.
,, 6th. Scarcely feeding.
,, 18th. Dead. About 200 half-mature *Adelges* eaten, probably less.

CAGE 3 (eggs and larvae for life history).

April 10th. One egg entered. Size 0.75 mm.
,, 18th. Egg darkening, bright yellow.
,, 19th. Egg showing brown tinges.
,, 20th. At 9 a.m. segmentation appearing.
,, 23rd. At 9 a.m. egg hatched.
,, 23rd—May 6th. Other eggs entered and hatched; high mortality.

May 1st. Egg laid April 20th, hatched.
,, 29th. Larva from egg hatched May 1st, spinning cocoon.
June 1st. Still spinning cocoon.
,, 8th. Pupated.

Egg instar—11 days.
Larval instar—38 days.

Cage 4 (eggs).

HEMEROBIUS STIGMA.

Date laid.	*No. of eggs.*	*Date hatched.*	*No. of days.*
April 10th	1	April 22nd	12
,, 11th	5	1 ,, 23rd	12
		1 ,, 24th	13
		3 ,, 25th	14
,, 12th	5	1 ,, 23rd	11
		2 ,, 26th	14
		2 ,, 28th	16
,, 13th	3	,, 26th	13
,, 15th	5	3 ,, 27th	12
		2 ,, 28th	13
,, 16th	1	,, 28th	12
,, 18th	1	,, 29th	11
,, 19th	2	1 ,, 28th	9
		1 ,, 30th	11
,, 20th	3	2 ,, 30th	10
		1 May 1st	11
,, 23rd	4	,, 3rd	10
,, 24th	11	,, 4th	10
,, 25th	1	,, 5th	10
,, 26th	5	,, 8th	12
,, 27th	0	—	—
,, 28th	4	,, 9th	11
,, 29th	3	,, 10th	11
May 1st	5	2 ,, 8th	7
		3 ,, 11th	10
,, 2nd	5	,, 14th	12
,, 4th	4	,, 16th	12
,, 8th	3	,, 20th	—
,, 9th	0	—	11
,, 10th	1	,, 22nd	12
,, 16th	9	8 ,, 26th	10
		1 ,, 25th	9
,, 17th	3	1 ,, 27th	10
		2 ,, 29th	12
,, 18th	1	,, 29th	11
,, 20th	1	,, 29th	9
Total	86		

CAGE 4X (life history—larvae).

April 23rd. Larvae failed to survive—newly hatched specimens added till May 1st.
,, 25th. First lot died.
10 a.m.: Three (eleventh eggs) hatched.
12 noon: Feeding. First on drop of fluid secreted by maturing *Adelges*.
3 p.m.: Mandibles sunk entirely into *Adelges* which was ultimately dry.
,, 27th. Some larvae dead—apparently unable to remove jaws from *Adelges*.
,, 28th. One larva punctured one egg without finishing it.
May 1st. All dead.

SECOND SERIES—A (life history and larval feeding figures).

CAGE 1A.

May 16th. One egg laid.
,, 24th. *Adelges* larvae hatching (about 750)
,, 26th. *H. stigma* larva hatched. } First Instar 7-8 days.
June 5th. Larval skin found (3-4 days old).
,, 18th. Stopped feeding (about 3,000 *Adelges eaten*).
,, 21st. Prepared for pupation—cocoon not or scarcely spun.

CAGE 2A.

May 16th. One egg laid.
,, 26th. Egg hatched. } Insufficient *Adelges* larvae hatched.
,, 29th. Died.

CAGE 3A.

May 16th. One egg laid.
,, 25th. (9 a.m.) hatched.
June 22nd. Larva full-grown. Still feeding.
,, 24th. Stopped feeding. (2,950 *Adelges eaten*.)

CAGE 4A.

May 16th. One egg laid.
,, 25th. One egg hatched. } Insufficient *Adelges* larvae hatched.
,, 29th. Larva died.

CAGE 5A.

May 17th. One egg laid.
,, 27th. One egg hatched.
,, 31st. Larva lost.

ACKNOWLEDGMENTS.

I wish to thank Mr. K. J. Morton, F.R.E.S., for his kindness in identifying *Boriomyia subnebulosa*, and for notes on distribution, abundance and habitat of the family, of which I have made free use in the text.

EXPLANATION OF PLATE III.

FIG. 1. Eggs of *Chrysopa* sp. (natural size).
,, 2. *Boriomyia subnebulosa*, ♀ (× 8).
,, 2A. *B. subnebulosa*, ♀, head.
,, 3. Egg of *Hemerobius stigma* on Douglas fir needle.
,, 4. Mature larva of *H. stigma* (× 10).
,, 5. Head of newly emerged larva of *H. stigma*.
,, 6. Tarsus of newly emerged larva of *H. stigma* with long empodium.
,, 7. Mandible of *H. stigma* larva.
,, 8. Maxilla of *H. stigma* larva.
,, 9. Apex of mandible of *H. stigma* larva.
,, 10. Prepupa of *H. stigma*.

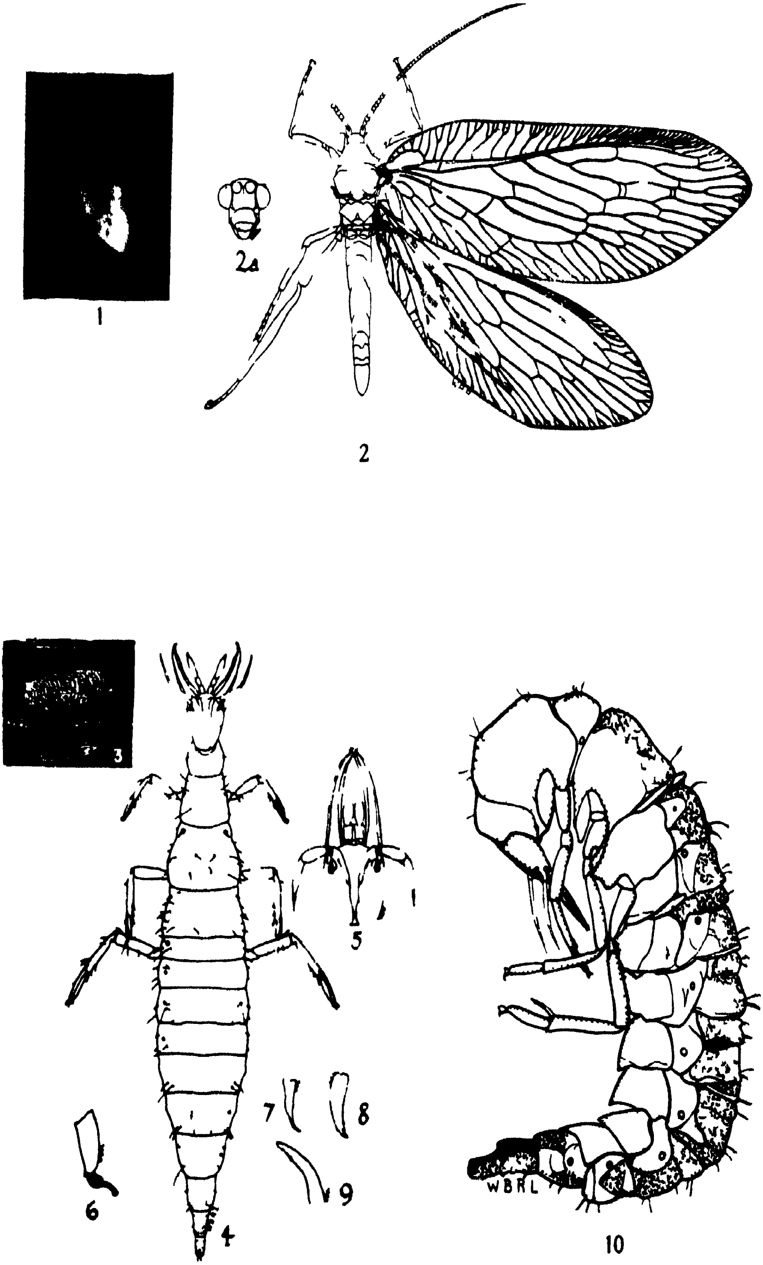
St. Helen's, Melrose, Roxburghshire.
June, 1936

OCCURRENCE OF AN AUSTRALIAN BEETLE, *ANTHRENOCERUS AUSTRALIS* HOPE, TOGETHER WITH *ATTAGENUS PICEUS* OL. VAR. *MEGATOMA* F. AT FINSBURY.

BY S. WAKELY

These two species of beetles having been found in numbers at Bunhill Row, Finsbury, in a large printing works, a few notes of their occurrence should be of interest. They have both been seen there for the last three or four years, but it was not until last winter that I attempted to discover the larvae. A search was made under some old cork lino on a bench and a few *Attagenus* larvae were seen amid the dust. Later, however, this larva was found in larger numbers under boxes standing on the floor and living between the floorboards. Larvae of another Dermestid beetle which subsequently proved to be *Anthrenocerus australis* Hope were also discovered at the same time, and seemed to be the more common of the two, a feature no doubt due to its being an active larva more readily perceived than the sluggish larva of *Attagenus piceus*. On one occasion over a dozen larvae of *Anthrenocerus australis* were found in a piece of dirty rag lying in a corner behind a box. Next, I tried to find out what they were feeding upon, and at one place discovered both species feeding on some dried condensed milk which had fallen behind a box. This gave me the idea of putting down cake-crumbs, biscuits, etc., which attracted the larvae freely. Some were collected and distributed to various correspondents, but the beetles are either difficult to rear or else take a long time to mature. Larvae of all sizes may be found at the same time.

The imagines commence to appear at the works in May, and continue all through the summer, the *Attagenus* being most noticeable at this stage, running along the edges of papers and books.



BORIOMYIA SUBNEBULOSA and *HEMEROBIUS STIGMA*

The *Anthrenocerus* is smaller and not so conspicuous but has a similar habit. A large number of *Attagenus piccus* meet with an untimely end by falling on their backs, a position from which they seem unable to extricate themselves when on a smooth surface such as a piece of paper. The building where these beetles were found is very large, and although I have only actually seen them on one of the upper floors, there is little doubt but that they occur in other parts of the building, and most likely in other works in this locality. It is interesting to know that *Anthrenocerus australis* has actually bred here in numbers for some years, and it will now have to be added to the long array of introduced species on the British list.

4 Auckland Road, Upper Norwood,
London, S.E.19.
July 17th, 1936.

AN AUSTRALIAN DERMESTID BEETLE, *ANTHRENOCERUS AUSTRALIS* HOPE, IN LONDON.

BY K. G. BLAIR, D.SC., F.R.E.S.

Some beetle larvae brought to me by Mr. S. Wakely as probably the larvae of *Attagenus piceus* Ol. var. *megatoma* Fab., of which the beetles had been taken in the same building, were seen to be no *Attagenus*, but to belong apparently to the genus *Trogoderma*, so their development was awaited with considerable interest. The larva is of the same short, active, bristly type as those of *Trogoderma* and *Anthrenus*, with erectile tufts of spear-head hairs on the sides of segments 5 to 7 of the abdomen. Each tergite bears a transverse row of strong, erect, finely-spinulose bristles across the middle; the tufts of fine spear-headed hairs are attached on the posterior part of the tergite behind this row of bristles, which curves round outside them laterally to the posterior angle, the posterior margin of the tergite not being emarginate towards the sides. These tufts are most highly developed on segments 6 to 8, but similar hairs, decumbent and directed towards the mid-dorsal this, including those of the thorax. These hairs, as well as the stouter hairs of the transverse rows, are very deciduous and are usually shed at pupation.

The larva of *Anthrenocerus* does not appear to differ essentially from that of *Trogoderma* (*T. granaria* Everts), though the tergites are darker and the erect hairs longer and stouter.

In *Anthrenus* the tufts of erectile hairs are apparently distinct from the main tergal plate and seated in an emargination in the lateral part of the posterior edge of the tergite and separated from it by a narrow band of clear membrane, and the transverse band of spinulose hairs is close to the posterior margin. In the well-known larva of *Ctesias serra*, in which the erectile tufts are still more highly developed, a somewhat similar arrangement is found, except that the transverse row of bristles is situated in the soft membrane between the tergite and the pads of the erectile tufts.

As is usual in the Dermestidae, the larval skin is not completely cast at pupation but merely splits down the mid-dorsal line, the pupa remaining within the distended larval skin and partly protruding through the split, this split in *Anthrenocerus* extending to the seventh abdominal segment.

The beetles began to appear about the beginning of June and continued to emerge for some weeks. They were found to be *Anthrenocerus australis* Hope, an Australian species formerly placed in *Trogoderma* but for which Arrow in 1917 created a new genus, based mainly on antennal characters. The antennae are eleven-jointed, the first two joints enlarged, subglobular, 3 to 8 very short and of even thickness, 9 to 11 forming a sharply defined compact club twice as wide as the preceding 6, 9 and 11 nearly twice as long as 10 and almost as long as the preceding 6 together. When at rest this club is entirely received into a deep, sharply defined cavity in the front half of the prothorax. They do not differ in the two sexes. *A. australis* is very similar in general appearance to *Trogoderma granaria* Everts but with three more regular though somewhat broken bands of white hairs across the elytra, the first from behind the scutellum to the shoulder and thence to the side margin, the second close behind the middle of the elytron and the third midway between this and the apex. A further difference is found on the basal segment of the abdomen, the margins of the intercoxal process being continued as raised lines right across the segment. In *Trogoderma* this segment is simple.

With these larvae were found numbers of another larva from which the beetle *Attagenus piceus* Oliv. var *megatoma* F. was subsequently reared. These are of the same elongate form and golden chestnut colour as the well-known larva of *A. pellio* L., but differ in certain details. The body is rather sparsely clothed with depressed hairs, which are not flattened and scale-like, and the posterior border of each segment bears a fringe of evenly spaced long setae of fairly uniform length and directed backwards; between these are a number of shorter setae, about half the length of the others and directed obliquely backwards and dorsally, while on each side are four erect setae placed slightly forwards of the posterior margin of the tergal plate. In *A. pellio* the depressed setae are for the most part distinctly flattened and lanceolate, as are the shorter oblique setae of the posterior margins of the segments, while the longer setae are more uneven in length, some as long as the tergal plate, others only half this length, and the erect setae are less obvious.

Mr. Wakely has kindly supplied the preceding note on the occurrence of these two beetles.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
July 17th, 1936.

DISENOCHUS MUNROI, A NEW HAWAIIAN BEETLE (COL. CARABOIDEA).

BY R. C. L. PERKINS, M.A., D.SC., F.R.S.

Nigroaeneus, nitidissimus, antennis, palpis, tibiis tarsisque rufo-brunneis. Pronotum ante marginem posteriorem et ad latera punctatum, angulis posterioribus obtuse rotundatis, utrinque ad margines laterales anguste sed distincte impressum sive deplanatum. Elytra oblongo-ovata, fortiter striato-punctata, punctis apices versus obsoletis. Long. circa 9.5 *mm.*

This species, while quite unlike any of those described from Molokai, is very similar to *D. fractus* Sh. of Maui. The latter is rather variable in sculpture, and some of the individuals are much more like *munroi* than others. In this species the pronotum along the raised lateral margins is distinctly though narrowly explanate or impressed from base to apex; the strial punctures of the elytra, at least towards the base, are closer and more regular, while the eighth stria is deeper and the depressions therein are different from those of *fractus*. The fourth joint of the front tarsi is less emarginate at the apex.

I have seen only a single specimen of this fine species, and it is not quite perfect, having lost a number of the antennal joints. It appears to be a male.

Hab.: HAWAIIAN ISLANDS, Molokai, above the head of the Wailau valley. Collected recently and sent to me by Mr. G. C. Munro, after whom I have named the species and from whom I received very much help when I was collecting on Molokai and Kauai in 1894 and afterwards.

4 Thurlestone Road,
Newton Abbot, Devon.
July 14th, 1936.

A note on Odontaeus armiger Scop.—I have received through my brother W. J. Saunders (who no longer collects) 12 specimens of the beetle taken by Dr. T. Clifford Last on lawns at his house at Tilford, near Farnham, Surrey. On June 27th he took two (♂ 7 mm., ♀ 10 mm.), one on a lawn in front of the house and one on the tennis-lawn behind. The ♂ agrees with Fowler's description of a 'small male.' On that day further specimens were sought for without success. On July 7th on patches of the tennis-lawn, recently watered with worm-killer, two more were found (a typical 9 mm. ♂ and a 6.5 mm. ♀): worm-killer was again used, but with no result. On July 12th four more were taken (two ♂♂ and two ♀♀). My brother wrote: 'There is no doubt that they are ejected from the worm-burrows by the worm-killer. They have always been found in a comatose state on isolated patches of the lawn where worm-killer has been applied to a worm-cast, and have become quite lively again when removed to a tube.' This does not apply to the specimen taken in front of the house. On July 13th in my brother's presence one more was captured by the same means: first you find a worm-cast, then you apply some worm-killer and water it in: then you leave it for some five to twenty minutes, and come back and find the *Odontaeus* in a comatose condition. On July 21st I received further specimens, making twelve in all. The same burrow never produced both worm and beetle. The house was built about three years ago on land formerly mostly covered with oak and holly trees and bracken; the subsoil is sand with a top spit of leaf-mould.—C. J. SAUNDERS, Barcombe Mills, Sussex: *July 21st*, 1936.

Ahasverus (Cathartus) advena Waltl in Sussex.—I first took this beetle in a straw-stack at Isfield, an adjoining parish, and have since taken it in three stackyards in Barcombe. There are four miles between the extreme stacks. This year, some 120 yards behind this house, there was a haystack bottomed with the haulm of stubble-turnips; in the fine hay left on this bottoming I took over 40 specimens in one day. Once the insect begins to move I find no difficulty in 'spotting' it with the naked eye, though I am short-sighted. On one occasion I shook a specimen out of some vegetable refuse in a meadow. —C. J. SAUNDERS: *July 21st*, 1936.

Cidnorrhinus quadrimaculatus L. ab. rimulosus Germ. and other Irish Coleoptera.—The following list contains records of some rare and local Irish beetles; one of these is *Cidnorrhinus quadrimaculatus* L. ab. *rimulosus* Germar (Ins. spec. nov. I. 230 (1824)), which is an addition to the British list. The typical form is common on nettles, but the ab. *rimulosus* appears to be very rare. Mr. Donisthorpe, who named the specimen for me, informs me that the aberration is known from Germany. This specimen was swept from a mixture of *Sisymbrium* and *Equisetum* at the side of the tram-road, Raheny, Co. Dublin, June 5th, 1936.

A number of the species mentioned below are evidently new to the various counties, and these are denoted by an asterisk.

Blethisa multipunctata L., Kilbarrack, Co. Dublin, August 1936. Some numbers taken from a waterhen's nest in a reed-bed.

**Leucoparyphus silphoides* L., Kilavullen, Co. Cork, August 1934. Two or three under stones.

**Tachinus humeralis* Grav., Glencullen, Co. Wicklow, October 1935. A number taken in the fungus *Armillaria mellea* about the foot of a tree.

T. subterraneus L., St. Annes, Clontarf, Co. Dublin, 1935. One by general sweeping.

**Conosoma immaculatum* Steph., St. Annes, August, 1935. Common in hay.

Lathrobium fulvipenne Grav. var. **letzneri* Gerh. St. Annes, March 1936. A single example in a dead *Lythrum* stem. This var. is not recorded as Irish.

**Stenus fornicatus* Steph., St. Annes, July 1935. One running on mud on lake shore.

**Acidota crenata* F., Glenasmole, Co. Dublin, September, 1935 (*Stelfox*).

**Olophrum fuscum* Grav., Colbinstown, Co. Wicklow, February 1934 (*Stelfox*).

**Agathidium laevigatum* Er., St. Annes, September 1935. One in haystack refuse.

**Silpha tristis* Ill., The Mullet, Co. Mayo, June 1936. Four reddish examples taken by Mr. Stelfox.

**Cychramus luteus* F. and var. **fungicola* Heer, Glencullen, in company with *Tachinus humeralis*.

**Corymbites aeneus* L., The Mullet, June 1936. Taken in some numbers by Mr. Stelfox. Known only from Cork hitherto.

Cantharis darwinianus Sharp, Raheny strand, Co. Dublin, June 1936. A single ♀ swept off *Beta*.

Ernobius mollis L., St. Annes, about 100 examples bred from small Austrian pine branches. Began to emerge July 1st and ceased on July 5th, 1936.

**Cryptocephalus pusillus* F. ab. **marshami* Weise., Glengariff, Co. Cork. Beaten from holly in company with the typical form July 27th, 1935, by Mr. Stelfox, the ab. has not been recorded from Ireland, so far as I am aware.

**Longitarsus atriceps* Kuts., Kilbarrack, Co. Dublin, April 1927. Determined by Mr. Donisthorpe. I have only two records for this species—Kerry and Armagh.

Phyllotreta atra All., Dollymount, Co. Dublin. April and May. This species was common this year, though I have never before taken it in the district.

P. nigripes F., Dollymount, May. Three or four swept in my garden.

**P. sinuata* Steph., St. Annes, May 1936, one, by general sweeping.

P. undulata Kuts. I have an example of this species in which the yellow elytral stripes are almost invisible, the whole insect being practically black; it was swept on the Mullet, Co. Mayo, some years ago.

Aphthona nonstriata Goeze, var. **aenescens* Weise, Kilkenny, May. One swept by Mr. Stelfox. I have also four black-legged examples, which look larger and generally darker than the typical form.

Chaetocnema hortensis Geoff., Wexford, August 1930. A single example swept at Cahore point.

Rhinosimus ruficollis L., St. Annes. This species is not common in North Co. Dublin and hitherto I have only taken it twice On the evening of July 7th I was examining tree-trunks for *Choragus sheppardi* Kirby when I came on a stump simply covered with *R. ruficollis* and took 29 specimens. I could have taken many more.

Orchestes alni L., St. Annes. Fairly plentiful on elms in the autumn of last year.

**Coeliodes erythroleucus* Gmel., Glengariff, Co. Cork and St. Annes, Co.

Dublin. In 1935 Mr. Stelfox brought me a single specimen of this species. In the Irish list it is stated 'There is an Irish-taken example in the Dublin Museum formerly in the collection of Trinity College,' so Mr. Stelfox's specimen has verified this record. Later, in April, 1936, I took five specimens in 'St. Annes.' These were usually taken by sweeping under *Ilex*, but on one occasion I found one on the turn-up of my trousers after walking through a field.

**Ceuthorrhynchus cochleariae* Steph., St. Annes, May 1936. A single specimen, by general sweeping.

C. erysimi F. ab. *chloropterus* Steph., St. Annes, May 1936. Swept from grass.

C. quadridens Panz., St. Annes, May. A number swept in a marshy field.

C. marginatus Payk., St. Annes, April and May. Plentiful on dandelions.

I wish to thank Mr A. W. Stelfox for specimens, Dr. Blair and Mr. Donisthorpe for naming (and verifying my determinations of) various specimens for me. In the above list I am responsible for the captures and naming unless where otherwise stated.—EUGENE O'MAHONY, National Museum of Ireland, Dublin: *July 13th*, 1936.

Ernobius nigrinus Sturm in Cumberland.—I took a number of this insect in June last by beating recently cut Scots pine branches and tops in a large plantation near Carlisle. This method of collecting I have practised for many years in this district, without, however, meeting with *E. nigrinus* until now. I believe most captures of the species have been in the Highlands of Scotland, and the only note of its occurrence in England that I can remember is from Allerthorp, Yorks, in this Magazine, 1931, p. 44. Occurring with the *Ernobius* was *Magdalis phlegmatica* Herbst, another species with a 'Scotch' flavour which, however, I have recorded from Cumberland a good many years ago. By way of contrast to the spread southwards of such insects as these, the spread northwards of the Longicorn *Tetropium gabrieli* Weise and its var. *crawshayi* Sharp is interesting, both forms having now been taken in Carlisle from larch butts felled on the Netherby Estate impinging on the Scotch border.—F. H. DAY, Carlisle: *July 21st*, 1936.

Langelandia anophthalma Aubé at Chatham.—In August last, somewhat by accident, I discovered two of the above-named beetles in my garden. These were found in finely sifted earth, taken from under a heap of fairly fresh horse-manure amongst some flowers in a small border within three yards of the house. My house is one of a terrace, in a fairly long street, with the usual town back-garden. The earth was sifted in the glaring noonday sun and I had left it for a time, after having taken the *Homalota* I was searching for, and on looking it over again I discovered the two *Langelandia*, not realising at the time the rarity of this species. I did not disturb this border again until last month, and one day I carelessly took a small garden trowel full of earth and sifted it on some newspaper, and to the surprise of my son and myself we took four *Langelandia;* we then sifted more earth and took two further specimens. That evening I took nine more, and within a week we had taken 32 in all, in little more than a square foot of earth, at a depth of from three to six inches.

According to Canon Fowler (Col. Brit. Islands, III, p. 193) the first British specimens were taken by Mr. Theodore Wood at Broadstairs in 1886 in old seed potatoes and no further record of its occurrence has appeared. Those found by myself were not in potatoes, of which none are grown within a mile or thereabouts. I am keeping a number to breed from, and have supplied them with whole and decaying pieces of potatoes, which they refuse to touch.

Langelandia may not be so rare as is generally believed; it is exactly like the earth in colour and extremely sluggish; it will not stir sometimes for nearly an hour after sifting, and cannot be seen among the small particles of earth unless it moves. The sieve I use is of perforated zinc, but the housewife's fine wire sieve is of sufficiently large mesh. This year *Anommatus 12-striatus* was taken rather plentifully under similar conditions.—J. A. STEPHENS, 44 Mount Road, Chatham: *July 17th, 1936.*

Society

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at Chantry Lodge, Guildford, on Saturday, May 30th, 1936, Mr. W. J. Kaye in the Chair.

Members present in addition to the Chairman:—Mr. H. Donisthorpe, Mr. H. Willoughby Ellis, Mr. Jas. E. Collin. Visitors present: Mr. H. E. Andrewes, Major E. E. Austen, Dr. K. G. Blair, Mr. Hugh Main, Mr. F. A. Oldaker, Mr. W. H. T. Tams, Mr. C. J. Wainwright, Dr. G. A. Waterhouse of Australia.

At 12.30 the guests were received by Mr. and Mrs. and the Misses Kaye on the terrace of their garden which overlooks beautiful and extensive views over the Surrey hills.

Amongst the interesting collections in the Chairman's Museum the Trinidad collection of Rhopalocera created much interest. The butterflies of Trinidad number over 600 species. The Sphingidae and several groups of mimetic species of *Heliconius* were also inspected and discussed. Amongst the latter *Heliconius charithonia*, in the larger Antilles, was mimicked by females of *Dismorphia* widely differing from the males.

At 1 o'clock luncheon was served and early in the afternoon most of the members and guests walked, under the guidance of the Chairman, up to St. Martha's Chapel, which stands on a hill 573 feet high. The views from this point are very fine and can be enjoyed towards every point of the compass. The present little church is barely 100 years old, having been entirely restored from what was nothing but a ruin. The original structure was built about 1190 on a spot once the scene of the execution of some early Christian martyrs (hence the corrupted name of St. Martha's) and was used as a Chantry by pilgrims journeying to Canterbury during the Plantagenet period.

On returning to Chantry Lodge, tea was served on the terrace in warm and sunny weather which enabled the view across the hills to be enjoyed in comfort in the open.

The guests dispersed about 6 o'clock with many pleasant memories of their visit.—H. WILLOUGHBY ELLIS, *Hon. Secretary.*

THE ETHIOPIAN SPECIES OF THE *FASCIATA* GROUP OF THE GENUS *BACTRIA* (= *PROMACHUS*) (DIPTERA, ASILIDAE).

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I. FOREWORD.

In the course of my researches on the feeding habits of predacious insects it was my privilege to study the collection of Asilidae and prey made by Dr. S. A. Neave in Nyasaland during the years 1912, 1913 and 1914, and presented to the British Museum (Natural History) by the Imperial Institute of Entomology in 1921. This series, comprising some 2,600 specimens, is probably the largest collection of Asilidae and their prey ever made in one district, and much credit is due to Dr. Neave for his skill and patience in making so many important bionomic observations in such a comparatively short time.

In the early stages of my work on the Neave collection considerable difficulty was experienced in the determination of species of the *fasciata* group of the genus *Bactria* (=*Promachus*). Similar difficulties had evidently been encountered by others, for at the beginning of the investigation the whole of the material in the general collection of the British Museum (Nat. Hist.) stood under three names (*Promachus robertii* Macq., *P. fasciatus* F., and *P. xanthotrichus* Bezzi), although many more species were involved. The present paper is an attempt to facilitate identification within the group, and was undertaken in order that Dr. Neave's bionomic observations might be recorded.

II. GENERIC NOMENCLATURE.

At the end of Meigen's original description of *Asilus pictus* (1820, 'Syst. Beschreib. Europ. Zweifl. Insekt.,' Aachen, **2**: 307, 2, Pl. 21, Figs. 6 and 8) occur the words 'Aus Ungarn; Herr Megerle von Mühlfeld schikte [*sic*] sie unter dem Namen *Bactria rufipes.*' In publishing Megerle's manuscript name Meigen gave it a status in nomenclature under Opinion 4 of the International Rules (*Cf.* E. Csiki, 1929, 'X^e^ Congrès International de Zoologie', Budapest, **2**: 1598) which states that 'Manuscript names acquire standing in nomenclature when printed in connection with the provisions of Art. 25, and the question as to their validity is not influenced by the fact whether such names are accepted or rejected by the author responsible for their publication'. Article 25 merely defines the law of priority and requires (prior to 1931), *a*, that the name be accompanied by an indication, or a definition, or a description, and *b*, that the author has applied the principles of binary nomenclature — requirements with which Meigen's work complies. Since the description of *rufipes* may be considered to include the description of the genus *Bactria,* the latter name is again valid under Opinion 43.

The name *rufipes* falls as a synonym of *pictus,* which has page priority, but under Opinion 4 the earlier name *Bactria* Meigen, 1820, must be substituted for the genus usually known as *Promachus* Loew, 1848. This synonymy was known to Kertész (1909, 'Cat. Dipt.', Budapest, **4**: 216) although the name was not adopted. A year later D. W. Coquillet (1910, 'The type-species of the North American genera of Diptera', *Proc. U.S. Nat. Mus.*, **37**: 499-647) accepted the older name, but subsequent authors have erroneously failed to follow him. It is quite evident from Loew's remarks (1848, *Linn. Ent.*, **3**: 392) that the name *Promachus* would never have been proposed if he had not been mistaken in believing that *Bactria* had been used elsewhere as a generic name. The complete synonymy is given below.

1820. ***Bactria*** Meigen, 'Syst. Beschr. Zweifl. Ins.', Aachen, **2**: 307-308, Pl. 21, Figs. 6 and 8.
GENOTYPE: *Asilus pictus* Meigen as *Bactria rufipes* (Mergerle MS.) Meigen by monotypy.

1838. ***Trupanea*** Macquart, 'Dipt. Exot.', Paris, **1** (2): 91.
GENOTYPE: *Asilus maculatus* Fabricius by original designation. [Preoccupied in Diptera by F. v. P. Schrank, 1795, 'Briefe Donaumoor', Mannheim: 147.]

1848. ***Promachus*** Loew, *Linn. Ent.*, **3**: 390.
GENOTYPE: *Asilus maculatus* Fabricius by subsequent designation of D. W. Coquillet, 1910, *Proc. U.S. Nat. Mus.*, **37**: 595.

1887. ***Philomachus*** Karsch, *Berlin. Ent. Zeitschr.*, **31**: 375.
GENOTYPE: *Asilus vagator* Wiedemann as *Philomachus rhopalocerus* Karsch by monotypy. [Preoccupied in birds by P. H. G. Moehring,

1758, 'Geschach. Vogel.' (Nozem. and Vosm. ed.) Amsterdam: 7 and 66.]

1925. *Trypanoides* Becker, *Ent. Mitt.*, **14**: 71.
GENOTYPE: *Trupanea testaceipes* Macquart by subsequent designation of E. O. Engel, 'Asilidae,' in E. Lindner, 1926, 'Die Fliegen der Palaearktischen Region,' Stuttgart, **24**: 22.

1930. *Enagaedium* Engel, *Konowia*, **8**: 459.
GENOTYPE: *Asilus Pœtinus* Walker by monotypy.

III. THE GENUS *BACTRIA* MEIGEN: DEFINITION AND SUBGENERA.

DEFINITION:

BACTRIA: As Asiline genus comprising robust, more or less hairy species. Antennae at their base widely separated from one another; style bare, apex pointed or dilated. Scutellum with hairs and bristles; metanotum bare. Claws sharply pointed. Wings with three submarginal cells (*i.e.* cell R_4 and two cells, 1st R_3 and 2nd R_3, formed by a recurrent vein which arises from vein R_4 and extends backwards to meet vein R_{2+3}); fork-point of vein R_{4+5} at or beyond the middle of cell R_5; vein R_4 bent so that cell 2nd R_3 is slightly constricted (somewhat as in a sole at the instep); vein R_5 reaching the costa beyond the apex of the wing; cell R_5 open. Abdomen moderately elongate, conical, not broad nor dorso-ventrally compressed; ovipositor without spines, short (formed by the last three segments) or long (formed by the last five segments); male terminalia stout or slender, with or without a tuft of snow-white hairs.

SUBGENERA: Dr. E. O. Engel, following an arrangement by the late Prof. F. Hermann, was the first to publish a subdivision of the so-called genus *Promachus* into subgenera (*Cf.* 1929 (1930), *Konowia*, **8** (4): 458, and 1932, *Ann. Transv. Mus.*, **14** (4): 251-2). In these two papers the genera *Philomachus* and *Trypanoides* were treated as subgenera of the comprehensive genus *Promachus*, the subgenus *Promachus sens. str.* was retained and a new subgenus *Enagaedium* was erected. Of the names given in the previous section of the present paper, *Trupanea* is a synonym of *Promachus sens. str.*, both having the same genotype. The genotype *picta* Meig. of the genus *Bactria* is described and figured as having the antennal style dilated at the apex, and is, therefore, congeneric with *Philomachus*, having *vagator* Wied. (=*rhopalocerus* Karsch) as the genotype. The name *Bactria* has priority over all the names within the group, and hence the comprehensive genus *Promachus* should now be known as *Bactria*, and may be divided into four subgenera, *viz.*—*Bactria, Promachus, Trypanoides* and *Enagaedium*. A key to these subgenera is given below:—

1. Apex of antennal style dilated .... *Bactria* Meig. *sens. str.*
—. Apex of antennal style pointed .... 2.
2. Ovipositor short, the two halves of the tenth tergite with the distal extremities pointed and diverging .... *Enagaedium* Engel.
—. Ovipositor short or long, the two halves of the tenth tergite sub-ovate and not diverging .... 3.
3. Ovipositor of medium size, formed by the last three segments .... *Promachus* Loew.
—. Ovipositor very long, formed by the last five segments *Trypanoides* Beck

IV. THE *FASCIATA* GROUP: DEFINITION, DISTRIBUTION AND DISCUSSION.

The subgenus *Promachus* includes a number of closely allied species having conspicuous tufts of white or yellow hairs on the first three abdominal segments. These form a natural and easily recognised group, conveniently known as 'the *fasciata* group' from the name of the oldest described species. The group is widely distributed, species having been described from South America, the East Indies and Africa. The present paper treats of Ethiopian species only; nine such species have been previously described; to these twenty-one new species are now added.

The numerous species of the group closely resemble one another, and the superficial characters to which most early descriptions are limited are rarely sufficient for the determination of species. The present paper is based upon an examination of the terminalia, the most distinctive structural differences occurring in the aedeagus,[1] of which figures are given for all species known to me. Although superficial colour differences are included in the following descriptions, great care must be exercised in their use until more material has been studied and the range of variation fully understood; at the present time determinations should always entail reference to the aedeagus. Other structural differences to be noted in the males include modifications in the shape of the ninth tergite, and of the eighth and ninth sternites of the abdomen; the form of the posterior legs, the arrangement of spines which they bear, and the relative width of the eye as compared with that of the face. The relative lengths of the antennal segments, which are so freely used in modern descriptions of Asilidae, are of little value in this group, as they show too much variation. Much time and care has been expended in the search for other valid structural

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[1] An excellent account of the morphology of the aedeagus is given by H. Reichardt (1920, 'Untersuchungen über den Genitalapparat der Asiliden,' *Z. wiss. Zool.*, **135**: 257-301), but systematists on the Asilidae make scarcely any reference to this organ. Within the *fasciata* group the aedeagus is exceedingly constant in shape for any one species, shows considerable differences in form in the various species, is easily figured, and may usually be recognised without dissection. Dipterists would be well advised to test its value in other groups of Asilidae.

specific characters, but without success; and, therefore, the descriptions which follow make no reference to the arrangement of the bristles and hairs of the thorax, tibiae and abdomen, the relative lengths of the tarsal segments, the pleural hairs, etc. The females closely resemble the males, but have a wider face, longer wings and more slender legs without spines near the base of the posterior femora; unless associated with males they can rarely be determined with satisfaction, as they lack the distinctive structural characters of the males.

The nine previously described species are *fasciata* Fabricius, 1775; *robertii* Macquart, 1838; *caffra* Macquart, 1846; **aequalis* Loew, 1857; **trichozona* Loew, 1857; **floccosa* Kirby, 1884; **xanthotricha* Bezzi, 1908; **gossypiata* Speiser, 1910; **mediospinosa* Speiser, 1913. Of these I have seen types of the six species marked with an askerisk.

According to V. von Röder (1890, 'Ueber *Asilus fasciatus* Fabr.', *Ent. Nachr.*, **16**: 109-10) the type of *fasciata* is at Copenhagen, but Dr. Lundbeck informs me that the specimen to which Röder refers is not the actual type, although it came from an old collection and was probably determined by Fabricius. *B. fasciata* was described from the Drury collection, and on Drury's death the collection was sold by public auction. A catalogue of the Sale with manuscript notes, preserved in the library of the Hope Department at Oxford, shows that his collection of Asilidae was sold to Kirby. This Lot most probably included the type of *fasciata*; I have been unable to trace its subsequent history. In 1821, Wiedemann redescribed *fasciata* from a specimen still preserved at Vienna. I have compared this insect with the one sent from Copenhagen and believe the two to be conspecific; in the absence of the actual type I accept them as representing the true *fasciata* of Fabricius.

One of the chief differences between *fasciata* and *aequalis* given by Loew in the original descriptions of the latter was a difference in the colour of the mystax, although he suspected an error in Wiedemann's description. Loew's suggestion was investigated by Röder, who showed that the mystax of *fasciata* was yellow like that of *aequalis*, not black as described by Wiedemann. On these grounds Kertész placed *aequalis* as a synonym of *fasciata*, and nearly all later workers on Asilidae have followed him. The two species are, however, quite distinct both as regards the genitalia and more superficial characters. Furthermore, the true *fasciata* is known to me only from West Africa, whereas *aequalis* is essentially an East African species ranging from the type locality in

Caffraria through Natal, Portuguese East Africa, Rhodesia and Nyasaland to Tanganyika.

B. floccosa Kirby was said to have been found in New Zealand, but F. W. Hutton (1901, 'Synopsis of the Diptera Brachycera of New Zealand', *Trans. New Zealand Inst.*, **33**: 21, footnote) omitted it from his list as he considered there must have been a mistake in the locality. He adds: 'There is no such place as Opobo in New Zealand, and so conspicuous an insect could hardly have eluded all our collectors. Perhaps it was collected at Opobo, in West Africa.'

The type specimen bears:—(i) Kirby's type label, (ii) a museum label giving as locality Opabo, N. Zealand, (iii) a smaller and evidently older label bearing the single word Opobo. The museum catalogue number is 80.33 and the book-entry corresponding to these figures agrees with that on the label (ii). J. G. Bartholomew (1922, 'The Times Survey Atlas of the World', London, Pl. 76) gives Opobo and Opobo River in Southern Nigeria. *B. floccosa* very closely resembles *B. fasciata* and although the two species were considered identical by Ricardo (1913, 1920) the aedeagus shows them to be distinct and the name *floccosa* should be restored to the list.

B. caffra Macquart is described as having the *first two* abdominal segments with white hairs and the legs with yellowish bristles and hairs. As is pointed out by Loew, it is possible that this description is erroneous and that Macquart intended to refer to the second and third abdominal segments, which in the *fasciata* group are always more conspicuously clothed with hair than is the basal segment. If Loew's suggestion be correct, then *caffra* must be considered as one of the *fasciata* group, but among the hundreds of specimens of the group which I have examined not one has the bristles of the legs yellowish, and the species remains unknown to me. Only an examination of the type can enable the identity of *caffra* to be established with any degree of satisfaction, but unfortunately it is not with other types of Macquart in the Bigot collection at Oxford or in the Paris Museum, and I have failed to trace it elsewhere. It may be that *caffra* belongs to some other group.

The only other type which I have not seen is that of *robertii* Macquart, described from a single female from Senegal as having the first three abdominal segments with yellow hairs, whereas throughout the *fasciata* group the hairs of the second and third abdominal segments are typically white. In many museums it has been the custom to assign all yellow-banded specimens to *robertii*, because no other yellow-banded species had been described, and the numerous specimens purporting to be *robertii* in such museums are not only from various localities, but appear to embrace more than one species. The fact that they are *all females* strongly suggests some kind of sexual dimorphism or polymorphism, but the problem is not a simple one for the following reasons :—(i) Several species appear to be involved. (ii) Two yellow-banded *males* were recently discovered amongst undetermined material, these having terminalia which are apparently indistinguishable from those of *fasciata,* a species of which a long series of white-banded males and females is known. (iii) White-banded females of many species are known. Until specimens are taken *in copula* or other evidence of their true affinities is forthcoming, it is clearly impossible to determine these yellow-banded females or the precise status of the name *robertii.*

The remaining names represent distinct species without presenting special difficulties.

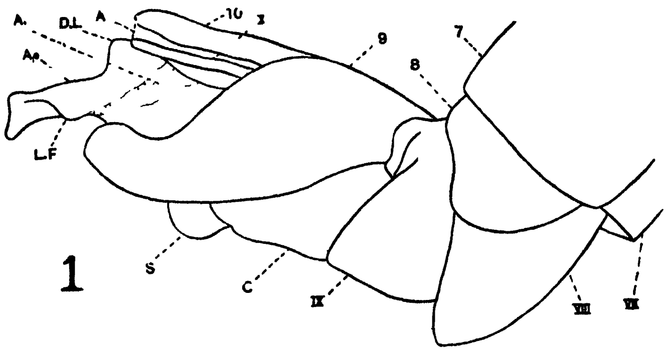

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FIG. 1.—*fasciata* F.; male terminalia, lateral view. Arabic numerals—tergites; roman numerals—sternites. A—anus; Ae—aedeagus; C—coxite of ninth sternite; D.L.—dorsal lobe of aedeagus; L.F.—lateral flange of aedeagus; M.A.—membranous area separating distal and basal parts of aedeagus; S—style attached to coxite of ninth sternite. The ninth tergite is divided into right and left halves which are the so-called 'upper forceps.' The tenth segment is the so-called 'anal segment.'

V. STRUCTURE OF THE MALE TERMINALIA IN THE *FASCIATA* GROUP.

The male terminalia (Figs. 1 and 7) consists of the eighth, ninth and tenth segments. The eighth tergite is about half as long as broad, and is partially retracted beneath the seventh tergite so that only the latero-distal angles remain prominent. The eighth sternite is usually strongly convex and about twice as long as broad; the distal extremity is rounded or truncate. The ninth tergite is divided longitudinally into two halves forming the so-called 'upper forceps,' which may be short or long, narrow or broad, straight or curved. The ninth sternite is about one-and-a-half times as broad as long, and with or without a membranous area in its distal margin. It bears a coxite (C) with which is articulated a curved style (S) sometimes showing specific differences in the wing-like expansions near its base. The tenth segment surrounds the anus, tergite and sternite each being divided longitudinally into two halves separated from one another by a membranous area. The aedeagus (Ae)[2] extends posteriorly between the paired coxites and styles, but is slightly more dorsal in position. At its base is a membrane connecting with the body wall. Towards the apex is a membranous area (M.A.), somewhat triangular in shape as viewed from the side, which has its base on the dorsal surface and extends posteriorly and ventrally (*Cf.* Fig. 1 ; in other figures only the position of the base of this membranous area is indicated). The form of the aedeagus, as seen in both lateral and dorsal view, is of the highest systematic importance.

VI. ACKNOWLEDGEMENTS.

I desire to acknowledge my indebtedness and to express my sincere thanks to the following naturalists without whose kind assistance it would have been impossible to undertake this investigation. To Major E. E. Austen, Prof. G. D. H. Carpenter, Sir Edward B. Poulton and Capt. N. D. Riley for the many facilities received in the British Museum (Natural History) and the Hope Department of Entomology, Oxford University Museum. To Messrs. J. E. Collin and C. J. Wainwright for information concerning the terminalia of Diptera. To Mr. A. Cuthbertson for material from the Department of Agriculture, Salisbury, S. Rhodesia. To the late Dr. F. A. Dixey and Dr. R. Hanitsch for advice on nomenclature. To Dr. R. Hanitsch for help in reading works in the German language. To Dr. F. W. Edwards for facilities for studying the type of *B. floccosa* Kirby and other specimens from the British Museum, many valuable suggestions and kind criticism of the manuscript. To Dr. H. Eltringham for advice on the technique of preparing genitalia. To Dr. G. Enderlein for the loan of the type of *B. trichozona* Loew and other specimens from the Zoologisches Museum der Universität, Berlin. To Dr. W. Lundbeck for a specimen of *B. fasciata* F. probably determined by Fabricius and for other specimens from the Univer-

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[2] For a detailed account of the structure of the aedeagus see Reichardt (*loc. cit.*).

sitetets Zoologiske Museum, Copenhagen. To Mons. A. d'Orchymont for the type of *B. xanthotricha* Bezzi and other specimens from the Musée Royal d'Histoire Naturelle de Belgique, Brussels. To Dr. Hans Sachtleben for specimens from the Deutsches Entomologisches Institute der Kaiser Wilhelm Gesellschaft, Berlin. To Dr. H. Schouteden for specimens from the Musée du Congo Belge, Tervueren. To Mons. E. Séguy for searching for types in the Museum National d'Histoire Naturelle, Paris. To Dr. P. Speiser for the three types of *mediospinosa* Speiser and for correspondence on the group. To Prof. Y. Sjödstedt for the type of *B. aequalis* Loew and a paratype of *B. gossypiata* Speiser from the Naturhistoriska Riksmuseum, Stockholm. To Dr. H. Zerny for Wiedemann's specimen of *B. fasciata* F. and other specimens from the Naturhistorisches Museum, Vienna. To Miss M. E. Prestidge for typing the manuscript.

The work was commenced with the help of a Senior Research Award of H.M. Department of Scientific and Industrial Research, and has been completed during the tenure of a Junior Research Fellowship at The Queen's College, Oxford.

VII. List of Species.

1. *fasciata* Fabricius, 1775, Sierra Leone, Guinea, Liberia; ? Ashanti, Nigeria, Senegal and Fernando Po.
2. *floccosa* Kirby, 1884 [New Zealand], ? Nigeria.
3. *xanthotricha* Bezzi, 1908, Belgian Congo, Angola.
4. *niveicincta* sp. nov., Uganda, Tanganyika, Belgian Congo.
5. *trichozona* Loew, 1857, Guinea, Gold Coast, Dahomey, Nigeria.
6. *aequalis* Loew, 1857, Caffraria, Natal, Portuguese East Africa, Rhodesia, Nyasaland, Tanganyika, Kenya.
7. *gossypiata* Speiser, 1910, Tanganyika, Nyasaland.
8. *acuminata* sp. nov., Nyasaland, Tanganyika.
9. *conradti* sp. nov., Nigeria.
10. *neavei* sp. nov., Nyasaland, Tanganyika.
11. *mixta* sp. nov., Uganda, Tanganyika.
12. *entebbensis* sp. nov., Uganda.
13. *crassifemorata* sp. nov., Cameroons.
14. *carpenteri* sp. nov., Uganda, Tanganyika.
15. *venatrix* sp. nov., Kenya.
16. *promiscua* sp. nov., Belgian Congo.
17. *wollastoni* sp. nov., Uganda, Kenya.
18. *cornuta* sp. nov., ? Uganda.
19. *erythrosceles* sp. nov., Belgian Congo, Uganda.

20. *rufotibialis* sp. nov., Africa.
21. *versicolor* sp. nov., Rhodesia, Belgian Congo.
22. *hastata* sp. nov., Belgian Congo, Tanganyika, ? Portuguese Congo.
23. *calcarata* sp. nov., Ashanti.
24. *zenkeri* sp. nov., Cameroons.
25. *mediospinosa* Speiser, 1913, Cameroons, Nigeria.
26. *speiseri* sp. nov., Nigeria.
27. *mesacantha* sp. nov., Nigeria, Liberia.
28. *mesorrhachis* sp. nov., Sierra Leone, Ashanti.

· *Species incertae.*

29. *caffra* Macquart, 1846, Caffraria.
30. *robertii* Macquart, 1838, Senegal.

VIII. GROUPING OF SPECIES.

I do not propose to give a key to species, as I believe determinations may be made more easily and more accurately by reference to the figures of the male terminalia. The following grouping of species is purely tentative and will need to be modified as more species are described.

In the first instance the *fasciata* group may be divided into two sections according to the position of the spines on the posterior femora of the male, *viz.* near the base (*fasciata* section), or near the middle (*mediospinosa* section). The latter section contains only four species: *mediospinosa*, *speiseri*, *mesacantha* and *mesorrhachis*, of which the first three are more closely allied to one another than to the last. The species of the *fasciata* section may further be grouped as follows:—

1. Upper forceps strongly curved inwards at the tips. Five species (*fasciata*, *floccosa*, *xanthotricha*, *niveicincta* and *trichozona*) of which the first three are more closely allied to one another than to the others, and the last is the most distinct.
2. Upper forceps short; distal part of aedeagus with a triangular latero-ventral process. Two species (*aequalis* and *gossypiata*).
3. Aedeagus acuminate. Two species (*acuminata* and *conradti*).
4. Upper forceps short; apex of aedeagus with two downwardly directed processes; most of the bristles yellow. One species (*neavei*).
5. Upper forceps long; aedeagus simple in lateral view, but with good specific characters in dorsal view. Six species (*mixta*, *entebbensis*, *crassifemorata*, *carpenteri*, *venatrix* *and* *promiscua*).
6. Upper forceps short and ovate; aedeagus almost parallel-sided. One species (*wollastoni*).
7. Upper forceps long; aedeagus broad as seen from the side. One species (*cornuta*).

8. Legs partly reddish; upper forceps long, aedeagus as seen from above somewhat expanded distally. Two species (*erythrosceles* and *rufotibialis*).
9. Apex of aedeagus spear-like as seen from above. Two species (*versicolor*, with legs partly testaceous, and *hastata* sometimes having cell R_5 closed).
10. Posterior tibiae of the male with a large spur, aedeagus with remarkable wing-like lateral processes. One species (*calcarata*).
11. Upper forceps long, distal part of aedeagus ovate as viewed from above. One species (*zenkeri*).

In addition to the above there are two *species incertae*; *caffra* said to be distinguished by the yellow bristles of the legs, and *robertii* with yellow hairs on the first three abdominal segments.

IX. DESCRIPTION OF SPECIES.

1. *Bactria fasciata* Fabricius.

1775. *Asilus fasciatus* Fabricius, Systema Ent., 793.7.
1805. *Laphria fasciata* Fabricius, Systema Antilat., 158.11.
1821. *Asilus fasciatus* Wiedemann, Dipt. Exot., 208.45.
1838. *Trupanea fasciatus* Macquart, Dipt. Exot., **1** (2): 92.
1858. *Promachus fasciatus* Bigot, in Thomson's Archiv. Ent., **2**: 354.
1890. *Promachus fasciatus* Röder, *Ent. Nachr.*, **16**: 109.
1910. *Promachus fasciatus* Speiser, Kilimandjaro Meru Exp., **10** (4): 96.
1920. *Promachus fasciatus* Ricardo (*partim*), *Ann. Mag. Nat. Hist.*, ser. 9, **5**: 171.

For other references see Kertész, 1909, Cat. Dipt., **4**: 219.

♂ ♀. Length of body 16-22 mm., of wing 11-17 mm.

♂. *Head.* Mystax entirely or chiefly yellow, outer and upper bristles often black; lateralia usually with black bristles and hairs, sometimes with a few yellow. Greatest width of eye about twice the width of face at narrowest point. Palps above and distally with bristles black, below and basally with bristles yellow. Beard yellow. Occipital bristles, the hairs above them and on the frons black. Antennae black, the basal segments with black hairs; antennal segments varying considerably in relative length, but usually with the basal and third segments subequal, each about twice as long as the second segment and less than half as long as the style, the third segment from three to four times as long as broad.

Thorax. Pronotum with both black and yellow hairs and a row of six to twelve black bristles. Mesonotum black without distinct stripes, at the sides with dark brownish pruinescence; hairs and bristles black except for a *few* yellow hairs occasionally present anteriorly, above the wing bases and on the post-alar calli.[4] Scutellum usually with all the hairs and bristles black, sometimes with the hairs yellow.

Legs. Legs black with black bristles and b
Anterior femora without bristles on posterior surface; length of posterior femora about four-and-a-half times the dorso-ventral diameter, about one-and-a-third times the length of posterior tibiae. Basal third of posterior femora with a slight postero-ventral swelling bearing a group of about twelve spines; ventral surface with a row of about five similar spines (some of which may be present in duplicate); postero-ventral surface with an oblique row of about four spines extending distally towards the posterior surface. Posterior tibiae slightly curved, longer than the tarsal segments together, slightly swollen distally where they bear a pad of very short spines.

Wings. Smoky, rather dark; cell 2nd R_3 with a large lanceolate greyish spot; costa with black bristles at the base.

Abdomen. Dorsal surface black with thin brownish-grey pruinescence at the sides; the first segment with a narrow band of hairs which varies considerably in colour; the second and third segments each with transverse tufts of long white hairs; the four following segments with short black bristles on the disc and at the sides with longer hair-like bristles which are usually black, although some or all may be whitish or yellowish; the eighth tergite shining black with black bristles. Ventral surface black; the first seven sternites with brownish-grey pruinescence and long whitish, yellowish or black hairs; the eighth sternite shining black with long erect black hairs, convex, rounded distally, not truncate. Upper forceps (ninth tergite) shining black with black bristles, broadest about the middle, narrower distally and extending beyond the anal (tenth) segment; the tips strongly curved inwards; length about two-and-a-half times the greatest breadth. Ninth sternite about twice as broad as greatest length and with a weakly chitinised median area in the distal margin. Basal part of aedeagus without ventral lobe, distal part with a dorsal lobe and on each side with a broad lateral flange (Figs. 1, 2 and 31).

♀. Resembles the male. Distinguished from the female of *P. mesorrhachis* by the latero-distal tuft of black bristles on each side of the eighth abdominal tergite.

Specimens seen: SIERRA LEONE:—A female probably determined by Fabricius, labelled 'Sierra Leone et Guinea' (Pflug, Copenhagen Mus.). 1 ♂, Baiama, 10.viii.1912; 2 ♂♂, Bambetuk, 11.x.1912; 4 ♂♂, Bo, 1-3.ix.1912; 1 ♂, Daru, 31.viii.1912; 1 ♀, Ghangbama, 9.x.1912; 3 ♂♂, 5 ♀♀, Jarra, 9.ix.1912; 1 ♂, Jowati, 10.viii.1912; 1 ♂, Mongheri, 14.ix.1912; 1 ♀, Moyamba, 25.ix.1912; 1 ♀, Rotifunk, 14.x.1912; 1 ♀, Senahu, 13.x.1912; 1 ♂, Tikonko, 31.viii.1912 (all *J. J. Simpson,* Brit. Mus.). 1 ♀, Maramu, 11.x.1924 (*E. Hargreaves,* Brit. Mus.). 2 ♂♂ without further data (Hope Dept.). GUINEA:—1 ♂, Sannum (Copenhagen Mus.). The male described by Wiedmann (1821) (Coll. Winthem, Vienna Mus.). LIBERIA:—1 ♂, Ghanga, ix.1926 (*J. Bequaert,* Mus. Congo).

Note.—In addition to the above I have seen the following specimens which may belong to this species. 1 ♂, ASHANTI, Kumasi, 21.x.1907, on leaf in bush path (*W. M. Graham*, Brit. Mus.). Differs from typical specimens in being more robust and in having the dorsal lobe of the aedeagus more strongly developed. 1 ♀, NIGERIA, Asaba, R. Niger (*W. H. Crosse*, Brit. Mus.); 1 ♀, ? SENEGAL (Brit. Mus.); 1 ♀, Fernando Po., Sta. Isabel, 23.vii.1900 (*L. Conradt*, Deut. Inst.). These females are not associated with males taken at the same time and place and it is impossible to be quite certain of the determination. 1 ♂, BELGIAN CONGO, Yambata, ii-iii.1914 (*De Giorgi*, Mus. Congo.). Closely resembles *B. fasciata* in the structure of the aedeagus, but has yellow hairs on the three basal abdominal segments.

2. *Bactria floccosa* Kirby.

1884. *Promachus floccosus* Kirby, *Trans. Ent. Soc. Lond.*, **1884**: 273.

1901. *Promachus floccosus* Hutton, *Trans. New Zealand Institut.*, **33**: 21, footnote.

1913. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 8, **11**: 413.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 172.

♂. Length of body 22 mm., of wing 16 mm.

♂. Closely resembles *B. fasciata*, but differs in having the dorsal lobe of the aedeagus much more strongly developed and elongate (Fig. 3).

Specimen seen: The male holotype (*H. W. Marsden*, Brit. Mus.) said to be from NEW ZEALAND, but more probably from S. NIGERIA (see p. 187).

3. *Bactria xanthotricha* Bezzi.

1908. *Promachus xanthotrichus* Bezzi, *Ann. Soc. Ent. Belg.*, **52**: 378.

1910. *Promachus xanthotrichus* Speiser, Kilimandjaro Meru Exp., **10** (4): 96.

1920. *Promachus xanthotrichus* Ricardo (*partim*), *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 180.

Closely allied to *B. fasciata* from which it differs in the following characters.

♂ ♀. Length of body 17-20 mm., of wing 12.5-15 mm.

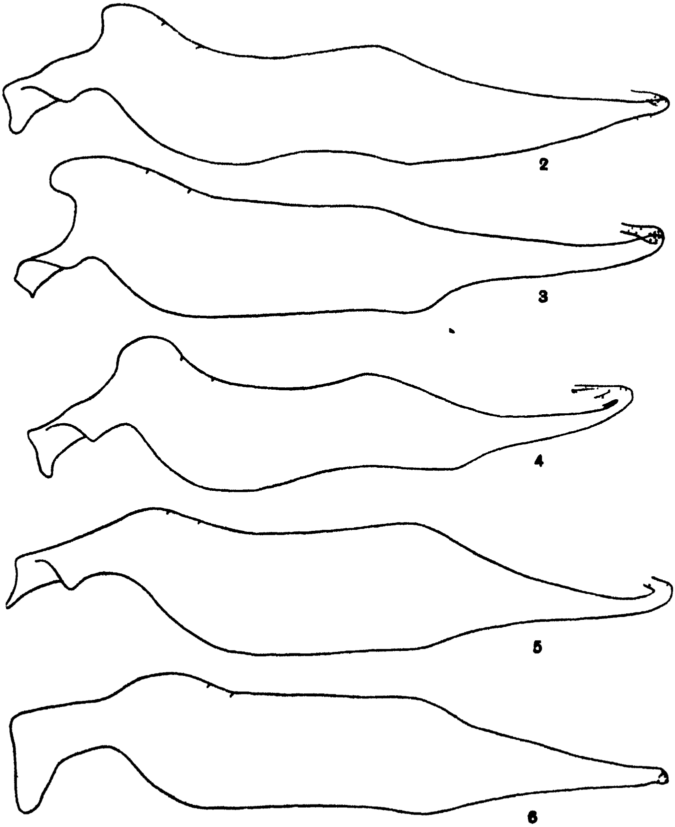
♂. *Head.* Mystax and palps with all the hairs and bristles yellow; lateralia with all or most of the hairs yellow. Occiput with black and yellow bristles intermixed or with all the bristles yellow. Frons with a few yellow hairs.

Thorax. Scutellum with all the hairs and all or most of the bristles yellow.

Abdomen. Aedeagus with dorsal lobe more rounded and almost semicircular as viewed from the side, the lateral flange broader as viewed from above (Fig. 4).

♀. Resembles the male.

Specimens seen: ANGOLA: — 1 ♂ (Brit. Mus.). BELGIAN CONGO: — The male holotype, Riv. N'Gamie, Chute de Semlia (*Mocquereys*, Brussels Mus.). 1 ♂, 1 ♀, Congo da Lemba, 1912 (*R. Mayné*, Mus. Congo).



FIGS. 2—6.—Aedeagus, lateral view. 2, *fasciata* F.; 3, *floccosa* Kirby; 4, *xanthotricha* Bezzi; 5, *niveicincta* sp. nov.; 6, *trichozona* Loew.

4. **Bactria niveicincta** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, 5: 172.

Related to *B. fasciata* from which it differs in the following characters :—

♂. Length of body 18-21 mm., of wing 13-14 mm.

♂. *Head.* Mystax with the central bristles yellow or white, the outer and upper bristles black; lateralia with black bristles and hairs. Greatest width of eye slightly more than twice the width of face at narrowest point. Beard yellow or white.

Thorax. Mesonotum and scutellum with all the hairs black.

Legs. Pale hairs less abundant and sometimes white instead of yellow. Posterior femora with ventral row of spines reduced to two or three spines only, the oblique row reduced in number or absent. Posterior tibiae with fewer spines in the ventro-distal pad, the spines arranged in two series meeting distally and enclosing a bare area.

Abdomen. The first tergite with white hairs, at the sides some of the hairs black; the fourth and following segments above with the hair-like bristles at the sides black. The first three sternites with long white hairs, the following sternites with black or both black and white hairs. Upper forceps (ninth tergite) broader distally. Aedeagus with the dorsal lobe scarcely present (Fig. 5).

Holotype: — ♂, UGANDA, Budongo Forest, Unyoro, 3400 ft., 11-15.xii.1911 (*S. A. Neave*, Brit. Mus.). *Paratypes* : — UGANDA, 1 ♂, Budongo Forest, Unyoro, 3400 ft., 11-15.xii.1911 (*S. A. Neave*, Brit. Mus.); 1 ♂, W. shores of Victoria Nyanza, Buddu, 3700 ft., 19-25.ix.1911 (*S. A. Neave*, Brit. Mus.). TANGANYIKA :— 1 ♂ (*Potts*, Hope Dept.). BELGIAN CONGO : — 1 ♂, Uelé (*Dr. Rodhain*, Mus. Congo); 1 ♂, Bokote, 12.vi. 1926 (*R. P. Hulstaert*, Mus. Congo).

5. *Bactria trichozona* Loew.

1857. *Promachus trichozonus* Loew, Öfvers Kongl. Vet. Akad. Förhandl., **14**: 359, 59.

1860. *Promachus trichozonus* Loew, Dipt.-Fauna Südafrika's, **1**: 129. 1 *bis*.

1910. *Promachus trichozonus* Speiser, Kilimandjaro Meru Exp., **10** (4): 96.

1920. *Promachus trichozonus* Ricardo, *Ann. Mag. Nat. Hist.*, Ser. 9, **6**: 170.

Related to *B. fasciata*, but distinguished by the yellow hairs on the frons and the following characters : —

♂ ♀. Length of body 17-20 mm., of wing 12-14 mm.

♂. *Head.* Mystax entirely yellow, lateralia with yellow hairs. Face slightly narrower relatively to width of eye. Palps usually with all the bristles yellow, sometimes with a few black bristles distally. Occipital bristles usually black, sometimes a few or all yellow, the hairs above them and on the frons chiefly yellow. The two basal antennal segments usually with both black and yellow hairs.

Thorax. Hairs and bristles black except anteriorly, posteriorly, above the wing bases and on the post-alar calli where invariably some of the hairs are yellow. Scutellum with yellow hairs and both black and yellow bristles.

Legs. Length of posterior femora about five times the dorso-ventral diameter. Postero-ventral group of spines not situate on a distal swelling, not very compact, some of the spines rather long; the oblique row either absent or represented only by one or two spines.

Wings. Not so dark as those of *P. fasciata;* cell 2nd R_3 with a smaller lanceolate greyish spot.

Abdomen. Dorsal surface black with a distinct band of yellowish-grey pruinescence at the sides; first segment with a narrow band of yellowish hairs; fourth, fifth, sixth and seventh segments with the bristles at the sides and sometimes also a few on the disc and along the hind margins of the segments yellow. The first seven sternites with long whitish or yellowish hairs. Aedeagus of the same type as that of *B. fasciata,* but distal part with a smaller dorsal lobe and without lateral flange (Figs. 6 and 34).

♀. Closely resembles the male, although the mystax sometimes has a few of the bristles black and the scutellar bristles may all be yellow.

Specimens seen: GUINEA:—The male holotype (Berlin Mus.); 1 ♂ (Bigot Coll.). GOLD COAST:—1 ♂, N. Territories, Dimawo, 16.vii.1914 (*J. J. Simpson,* Brit. Mus.). DAHOMEY:—1 ♂, 1-5.v. 1894; 1 ♂, 15.v.1894; 1 ♂, 1894; all from Misahöhe, Togo (*E. Baumann*, the first two in Berlin Mus., the last in Deut. Inst.). NIGERIA: — ♂ and ♀ *in copula*, 26.ix.1913; 2 ♀♀, 28.vi.1913 (*W. A. Lamborn*); 1 ♀, 9.xi.1913 (*C. O. Farquharson*); all from Ibadan, Moor Plantation (Hope Dept.). 1 ♀, S. Nigeria, 1912 (*A. D. Peacock,* Brit. Mus.). WEST AFRICA:—1 ♂ (Hope Dept.). NO DATA:—1 ♂ (Copenhagen Mus.); 1 ♂ (Bigot Coll.).

6. *Bactria aequalis* Loew.

1858. *Promachus aequalis* Loew, Öfvers. Kongl. Vet. Akad. Förhandl., **14**: 358. 58.

1860. *Promachus aequalis* Loew, Dipt.-Fauna Südafrika's **1**: 127.1, tab. 1, fig. 50.

1890. ? *Promachus fasciatus* Röder (*partim*), *nec* Fabricius, *Ent. Nachr.*, **16**: 109.

1905. *Promachus aequalis* Adams, *Kansas Univ. Sci. Bull.*, **3**: 152.

1909. *Promachus fasciatus* Kertész (*partim*), *nec* Fabricius,' Cat. Dipt., **4**: 216, 220.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 171.

1920. *Promachus xanthotrichus* Ricardo (*partim*), *nec* Bezzi, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 180.

Closely allied to *P. gossypiata* Speiser.

♂ ♀. Length of body 15-23 mm., of wing 13-18 mm.

♂. *Head.* Mystax entirely or almost entirely yellow, sometimes with a few of the outer hairs black; lateralia usually with yellow hairs. Greatest width of eye about one-and-three-quarter times the width of face at narrowest point. Palps with all the bristles and hairs yellow or with both black and yellow ones. Occipital bristles usually black, but sometimes with a few yellow, the hairs above them and on the frons sometimes black, sometimes black and yellow intermixed. The two basal antennal segments with all the hairs black or with some black, others yellow.

Thorax. Pronotum usually with both black and yellow hairs and a row of black bristles, sometimes with a few of the bristles and all the hairs yellow. Mesonotum with a broad medio-dorsal blackish stripe subdivided longitudinally, and on each side with a broad latero-dorsal blackish stripe subdivided transversely into two large spots and a small triangular posterior spot; pruinescence at sides and between the spots yellowish-brown. Hairs black except for a few yellow ones often present anteriorly, posteriorly and above the wing bases. Scutellar bristles black or black and yellow intermixed; the hairs yellow or black and yellow intermixed.

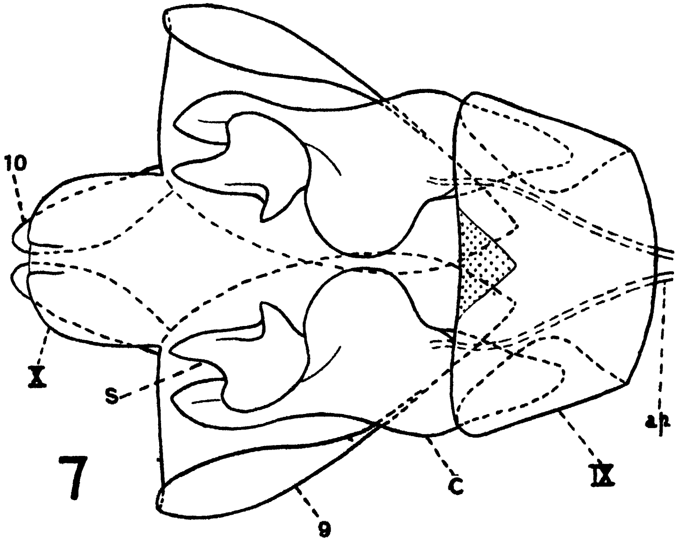


FIG. 7.—*aequalis* Loew, male terminalia, ventral view, aedeagus removed. Arabic numerals—tergites; roman numerals—sternites; ap—apodeme; c—coxite; s—style.

Legs. Yellow hairs more abundant than in *B. fasciata.* Length of posterior femora about four times the dorso-ventral diameter. The group of spines near the base of the posterior femora more compact and situate on a more prominent swelling than the corresponding group in *B. fasciata*; the ventral row consisting of about seven spines which are rarely present in duplicate and which are more closer together than the corresponding spines in *B. fasciata;* the oblique row of spines either absent or at the most represented by one or two spines. Posterior tibiae not so distinctly curved as those of *B. fasciata.*

Wings. Not so dark as those of *B. fasciata;* cell 2nd R_3 with lanceolate greyish spot rather smaller than that in *B. fasciata;* costa with yellow bristles at the base.

Abdomen. Dorsal surface black with a distinct band of greyish-brown pruinescence at the sides; the first segment with a narrow band of hairs which are usually entirely or largely yellowish, although sometimes a few of the hairs are black and rarely all may be white; the fourth, fifth, sixth and seventh segments with the long hair-like bristles at the sides chiefly yellow, although sometimes with whitish and nearly always with black bristles intermixed; the sixth and seventh segments (and rarely the fifth) sometimes with yellow bristles along the hind margins and others on the disc. The first seven sternites with greyish pruinescence, yellow bristles and hairs; the eighth sternite somewhat truncate, the long bristles yellow or black and yellow intermixed. Upper forceps (ninth tergite) short, somewhat pear-shaped, about twice as long as broad, not extending beyond the anal (tenth) segment, the tips scarcely turned inwards; the bristles usually black, sometimes with a few yellow. Ninth sternite as in *B. fasciata.* Basal part of aedeagus with a ventral lobe; distal part on each side with a triangular latero-ventral process, but without a distinct dorsal lobe (Figs. 7, 8 and 32).

♀. Closely resembles the male. Distinguished from the females of *B. gossypiata* by the lighter thoracic pruinescence and the more slender ovipositor.

Specimens seen: CAFFRARIA:—The female holotype (Stockholm Mus.). NATAL:—1 ♂, iii.1897; 1 ♂, 5.ii.1908; both from Malvern (*G. A. K. Marshall,* Brit. Mus.). 1 ♂, Malvern, 700-800 ft., 19.i.1904 (*C. N. Baker,* Hope Dept.). 1 ♂, 1 ♀, Zululand, Eshowe, 23.iii.-22.iv.1926 (*R. E. Turner,* Brit. Mus.). PORTUGUESE EAST AFRICA:—1 ♂, Delagoa Bay (Bigot Coll.). 1 ♀, Delagoa (*W. Distant,* Brit. Mus.). RHODESIA:—8 ♂♂, 12 ♀♀, Mt. Chirinda, 3800 ft., 21.xii.1911—5-20.iii.1912 (*C. F. M. Swynnerton,* Hope Dept.). 7 ♂♂, 11 ♀♀, Mid. Chambezi Valley, Chinsali district, 4000 ft., 12-20.iv.1908 (*S. A. Neave,* Hope Dept.). 1 ♂, Luangwa Valley, Petauke, 2400 ft., 11.i.1908 (*S. A. Neave,* Hope Dept.). 2 ♂♂, 5000 ft., 1899 and 5.ii.1905 (*G. A. K. Marshall,* Hope Dept.); 1 ♀, 5.i.1900 (*R. H. Thomas,* Brit. Mus.); all from Mashonaland, Salisbury. 1 ♀, Mashonaland, Mazee, xii.1905 (*G. A. K. Marshall,* Brit. Mus.). 1 ♂, 1 ♀, Umtali, xii.1934 (Dept. Agric., Salisbury). NYASALAND:—295 ♂♂, 395 ♀♀, Mt. Mlanje and Ruo Valley, nearly all between 10.i.1913 and 18.iv.1913, a few in 1914 (*S. A. Neave,* Brit. Mus.); 1 ♀, Mlanje, i-ii.1914 (*J. B. Davey,* Brit. Mus.); 1 ♂, Port Herald, 24.iv.1913 (*J. E. S. Old,* Brit. Mus.); 3 ♀♀, L. Nyasa, Monkey Bay, ii.1910 (*H. N. Tate,* Brit. Mus.). TANGANYIKA:—3 ♂♂, 1 ♀, Morogoro, 2.v.1922 (*A. H. Ritchie,* Brit. Mus.). 1 ♂, 4.ii.1928; 1 ♂, 1 ♀, 23.iv.1928, Kondoa, (*T. Nash,* Hope Dept.). 2 ♂♂, no further data (*Potts,* Hope Dept.). 1 ♂, near Dar-es-Salam, i.1894 (*Stuhlmann,* Berlin Mus.). KENYA:—1 ♂, Maziwa, Mitatu and Maungu, 14.iii and 4.iv.1897 (*C. S. Betton,* Brit. Mus.).

(*To be continued.*)

GASTRALLUS LAEVIGATUS OL. (COL. ANOBIIDAE), A GENUS AND SPECIES OF COLEOPTERA NEW TO BRITAIN.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.
Department of Entomology, British Museum (Nat. Hist.).

The genus *Gastrallus* Jacq. du Val (Glan. Ent. 2: 1860, 142) can at once be distinguished from all the other British genera in the tribe *Anobiini* by the fact that the elytra are practically without striae. It is a small genus consisting of some ten species, of which four have a Palaearctic distribution.

Gastrallus laevigatus Ol. (Ent. 2: 1790, 12) is about the size of a medium *Anobium punctatum* De G., but varies considerably in dimensions. It is of a dark greenish-gray colour and is clothed with a variegated yellowish pubescence. The femora and the first and last three joints of the antennae are dark red, the tibiae are a lighter red, and the tarsi and joints 2 to 6 of the antennae are testaceous. The thorax at the base is as broad as the base of the elytra, and there is no little tubercle at the anterior border as in *immarginatus* Müll., the other European species mentioned in Reitter's 'Fauna Germanica.' The latter is common in Germany, but *laevigatus* is said to be rare. It is recorded from Central and Southern Europe, Germany, Cyprus, Austria, Bosnia, Corsica, Syria, and Palestine.

On July 19th, when collecting in Windsor Forest in company with Mr. Allen, we were examining a pile of wood, fallen branches cut up and parts of trees that had been felled, of oak, elm, and beech. I saw a beetle on a log, and I said, 'That cannot be our *Anobium* as it is pubescent and shining.' He replied, 'No! it cannot,' and I found he was looking at another specimen which he had perceived at the same time as I had mine. Some six specimens were captured on this occasion. On reaching home I ran the genus down by Reitter, making the species to be probably *laevigatus*. This was confirmed next day at the Natural History Museum by comparing it with specimens in the general collection. On a subsequent visit to Windsor, on July 21st, we captured some eighteen more specimens. The beetle seemed to prefer to rest on the elm logs.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
July 29th, 1936.

Irish Coleoptera: a Correction.—In my note on p. 179 of the August number of this Magazine, I noted *Rhinosimus ruficollis* L. as being found commonly on a tree stump. This is a mistake, as the species I intended to record is *Vincenzellus viridipennis* Lt.—EUGENE O'MAHONY, National Museum, Dublin: *August 10th*, 1936.

NEW SPECIES OF STAPHYLINIDAE (COL.) FROM MAURITIUS.

BY MALCOLM CAMERON, M.B., R.N., F.R.E.S.

OXYTELINAE.

Lispinus propinquus sp.n.

Rather convex, shining black, the antennae and legs red. Length 3 mm. In size, build and lustre resembling *brevicornis* Kr., but with the antennae thinner and a little longer, the thorax rather more closely punctured, the elytra more distinctly and closely punctured. Head without frontal impressions, finely, moderately closely punctured, the ground sculpture feeble, more or less wavy. Antennae with the third joint as long as the second, fourth to sixth a little longer than broad, gradually decreasing in length, seventh stouter than the sixth, about as long as broad, eighth to tenth transverse. Thorax slightly transverse (4.75 : 4), convex, the sides slightly rounded in front, straighter and a little retracted in the posterior third, the posterior angles obtuse, without trace of median or lateral impressions; along the posterior half in the middle with an extremely fine impressed line; the puncturation as on the head, the ground sculpture feeble, more or less longitudinal and wavy. Elytra longer (5.75 : 4) than the thorax, very finely, moderately closely punctured on the inner half, more sparingly externally, the ground sculpture as on the thorax. Abdomen distinctly coriaceous at the bases of the segments, elsewhere with an extremely fine, more or less longitudinal wavy ground sculpture, very finely and very sparingly punctured.

Les Mares, 7.xii.35. Unique.

Lispinus vinsoni sp.n.

Somewhat depressed, black, the last segment of the abdomen reddish, the head and thorax shining, the elytra and abdomen less so. Antennae and legs reddish-yellow. Length 2.3—2.5 mm.

In size and build resembling *iyeri* Bernh., but more shining, differently coloured and with thinner antennae. Head bi-impressed in front, finely and sparingly punctured except in front, which is almost impunctate, before the base with a pair of larger punctures; ground sculpture distinct, coriaceous. Antennae extending a little beyond the middle of the thorax, second and third joints short, of equal length, fourth to sixth small, slightly transverse, seventh to tenth more strongly so, eleventh a little longer than the ninth and tenth together. Thorax transverse (3.3 : 2.5), the sides rounded in front, distinctly retracted and straighter in the posterior third, the posterior angles obtuse, the lateral impressions short, superficial, the median also superficial; along the middle of the posterior half with a very fine impressed line, the punctures a little larger than those of the head and sparing, the ground sculpture similar. Elytra longer (4 : 2.5) than the thorax, each with a pair of moderate punctures, one about the middle of the disc, the other between it and the base, externally with a few extremely fine punctures, ground sculpture distinct, coriaceous. Abdomen coriaceous, practically impunctate.

Forest Side, 12.i.35.

Oxytelus (Anotylus) vinsoni sp.n.

Very shining, head and abdomen black, the margins of the antennal tubercles and the frontal margin yellow; thorax yellowish-red; elytra yellow. Antennae reddish-brown, the first five joints and legs reddish-yellow. Length 2 mm.

In build somewhat resembling *nitidulus* Gr., but in all other respects different. Head transversely subquadrate, as broad as the thorax, the frontal margin truncate, the posterior angles briefly rounded, the eyes nearly as long the temples, the sculpture consisting of small and very small scattered punctures, the depressed clypeus almost impunctate, the moderately elevated antennal tubercles impunctate. Antennae with the first joint clavate, the third shorter than the second, fourth to sixth small, transverse, seventh to tenth more strongly so, eleventh conical, as long as the two preceding together. Thorax transverse (3.75 : 3), trapezoidal, along the middle narrowly sulcate, the lateral sulci scarcely indicated, the lateral impressions distinct and with a few moderate punctures, the disc with a few smaller scattered ones. Elytra slightly longer and broader than the thorax, not at all striate, finely and sparingly punctured. Abdomen extremly finely, scarcely perceptibly and very sparingly punctured. The whole insect without trace of ground sculpture.

Moka, 24.iv.35. In tortoise excrement.

Holotrochus lineatocollis sp.n.

Moderately shining black, the elytra brown, the posterior margin of the seventh and whole of the eighth abdominal segment reddish. Thorax with two fine, close, impressed lines along the middle. Antennae and legs reddish-yellow. Length 3.3 mm.

Head superficially bi-impressed in front, the anterior margin truncate, very finely, moderately closely punctured, distally coriaceous. Antennae with the third joint a little longer than the second, fourth to sixth a little longer than broad, seventh to tenth transverse. Thorax transverse (5 : 3), the sides almost straight, little more retracted behind, the angles rounded, the posterior distinctly impressed; on each side of the middle with a fine impressed line extending nearly to the anterior and posterior margins and separated from its fellow by a very narrow impunctate space, the puncturation rather finer than but as close as on the head, the ground sculpture similar. Elytra longer (5 : 3) than the thorax, finely and irregularly wrinkled, extremely finely and very sparingly punctured, ground sculpture absent. Abdomen coriaceous, practically impunctate.

Stanley, 27.xi.32. Unique.

STAPHYLININAE.

Pachycorynus quadriceps sp.n.

Black, the head rather less shining than the rest of the body, the elytra brownish-yellow, the posterior and elevated side margins of the abdominal segments reddish. Antennae reddish-brown. Legs reddish-yellow. Length 5mm.

Of the size and general facies of *dimidiatus* Motsch., but with differently coloured elytra, longer, parallel-sided, more coarsely punctured head, more punctured thorax and longer antennae. Head a little longer than broad, the sides parallel, puncturation moderately fine, umbilicate, moderately close, impunctate along the middle, the ground sculpture distinct, more or less longitudinal and wavy. Antennae with the penultimate joints longer than in *dimidiatus* and so less transverse. Thorax with dorsal row of about six small punctures, externally with some smaller, scattered, irregular ones, the ground sculpture weaker than on the head. Elytra as long as the thorax, the puncturation rather close and much less fine than in *dimidiatus*. Abdomen extremely finely, sparingly punctured.

Les Mares, 7.xii.35. Unique.

ALEOCHARINAE.

Paracyphea atra sp.n.

Black, moderately shining. Antennae and legs reddish-yellow, the last joint of the former blackish. Length 1.75 mm.

Build of *tenuipunctata* Bernh., but blacker and a little more robust, the thorax a little less finely and distinctly less closely punctured, elytra less finely and more roughly punctured, the abdomen much more closely punctured. Head much narrower than the thorax, extremely finely, rather sparingly punctured, indistinctly coriaceous. Antennae thickened towards the apex, the third joint a little shorter than the second, fourth small, about as long as broad, fifth to tenth gradually more transverse, the penultimate a half broader than long, the eleventh longer than the two preceding together. Thorax transverse (4 : 2.5), the sides strongly rounded, the posterior angles rounded; very finely, rather closely punctured and without ground sculpture. Elytra as long as and scarcely broader than the thorax, finely, rather closely, distinctly roughly punctured. Abdomen parallel, very finely, closely punctured throughout. The whole insect with a fine, moderately close grey pubescence.

♂. Seventh dorsal segment with four little keels, of which the two median ones are much smaller. Eighth dorsal segment with the posterior margin truncate and furnished with five small teeth and a larger one externally on each side.

Gorges, Riviere Noire, 16.i.35. Unique.

15 Teesdale Road, Leytonstone,
London, E.11.
August 10th, 1936.

SOME MORE NEW OR LITTLE KNOWN BRITISH SAWFLIES (HYMENOPTERA SYMPHYTA).

BY ROBERT B. BENSON, M.A.
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The species marked with an asterisk (*) are additions to the British list.

Cephus nigrinus C. G. Thomson.

This species was first found in Britain in Warwickshire in 1932 by J. W. Saunt (1933). Since then my colleague J. F. Perkins collected some specimens of it on *Juncus* in beech woods near Beaconsfield, Bucks, 26.v.1935.

**Pamphilius latifrons* (Fallén).

There is one ♀ of this very conspicuous species in the British Museum, and it was taken on Stanmore Common, Middlesex, vi.1921, by the late Hon. N. C. Rothschild. There is another ♀ in the Harwood collection which I have been able to examine through the kindness of Miss Harwood; this second specimen was taken in Brickett Wood, Herts, vi.1925, by P. Harwood.

Neurotoma mandibularis (Zaddach).

In the Harwood Collection is a second and unrecorded British specimen of this species, a ♀ taken in the New Forest, vi.1907, by P. Harwood—actually therefore earlier than Donisthorpe's specimen of 1916 (Morice, 1916).

Through the kindness of Prof. G. D. Hale Carpenter I have been able to examine Donisthorpe's specimen in the Morice Collection at the Hope Department, Oxford. Morice based on this specimen his description of the male of the species; the title of his paper was '*Neurotoma mandibularis Zadd.,* ♂ *. . . a sawfly new to Britain, and in this sex new to science*'*!* The male, however, is still unknown; Donisthorpe's specimen, the male allotype of the species, is really a female!

Coryna flavens (Klug), Lep., 1828 (=*Brachythops seminigra* Curtis 1839, new synonymy).

In Curtis, 1839, 16, p. 764, under *Allantus flavipes* occurs the following: '. . . but I must not omit to notice a remarkable departure from the typical structure, which Mr. Haliday has pointed out to me in a species allied to Selandria, with very short palpi containing only 5 and 3 joints instead of 6 and 4. Mr. Haliday has only seen the males which he took at Holywood, and has named them *seminigra*, and perhaps Brachythops may be considered an appropriate generic name.'

This perfectly valid description of a genus and species has been entirely overlooked by all the cataloguers heretofore. With the help of Mr. A. W. Stelfox, of the National Museum of Ireland, Dublin, who had access to an old manuscript of Haliday's, it is evident that the species mentioned was later recognised by Haliday as belonging to *Coryna flavens* Klug, which, I find, has got these peculiar short palps to its mouth parts! This, in addition to its small eyes, indicates that *Coryna* is better regarded as generically distinct from *Selandria*.

Scolioneura tenella (Klug).

On 26.v.1936 I found mines of this species on an isolated lime (*Tilia europaea* L.) at the edge of Brickett Wood Common, Herts, and on 31.v.1936 on planted limes round the artificial pond on Chipperfield Common, Herts. This sawfly has only once before been recorded in Britain, and that was by Morice (1922) from limes in his garden at Woking, Surrey. These records suggest that the species is introduced, and not a true native to this country.

**Fenusella glaucopis* (Konow).

On 18.v.1936 I collected one ♀ of this species on a leaf of aspen (*Populus tremula* L.) on Aldbury Common, Herts, and on 26.v.1936 I collected a second ♀ of the same species at Brickett Wood, Herts, also settled on aspen. At the beginning of June in both these localities mines of what are almost certainly this species were collected from leaves of aspen, and at the beginning of July mines on aspen containing very similar larvae were collected near Farnham, Surrey. I am indebted to Drs. Walther Horn and Hans Sachtleben for lending me for comparison type material of this species from Konow's collection in the Deutsches Entomologisches Museum, Berlin.

Hoplocampa ariae Benson.

When I described this species (Benson, 1934, pp. 254-256) I said that I had found ' the larvae of what is almost certainly this species feeding on the fruit of whitebeam ' (*Sorbus Aria* Ehrh.).

In 1934 I duly bred out some of these larvae and established the food-plant of this species. In the Chilterns round Tring the species appears to be common wherever whitebeam grows, and in the last few years I have rarely found a tree growing wild in which some of the fruit were not infected. The adults owing to their short flight period and partiality for sunshine are more difficult to obtain. In the middle of June, 1935, I searched the flowers of whitebeams growing at about 3,000 feet near Euseigne, Val d'Herens, Valais, Switzerland, on many days without finding the adults, but at the end of the month, when visiting the spot again, I found fruit infected with a *Hoplocampa* larva almost certainly this species, which thus appears to occur also in Central Europe.

***Priophorus laevifrons** sp.n.

Trichiocampus sp. Perkins (1929, p. 299).

♂ ♀. *Colour* black except for the tibiae and tarsi, which are yellowish-white. *Wings* hyaline; stigma, costa and venation brown.

♀. *Length* 3.5 to 5 mm.; forewing 4.5 to 5.5 mm.; antenna 3 to 3.2 mm.

♂. *Length* 5 mm.; forewing, 5.5 mm.; antennae not complète.

Head. Mouthparts normal; clypeus emarginate in front; malar space about as long as breadth of base of mandible; segment 3 of antenna shorter than 4 and equal in length to 5, in ♀ curved, in ♂ with basal projection; frontal area scarcely defined, with a very smooth and shining surface without tubercles; frontal furrow not separated from supra-antennal groove; POL=OOL.

Thorax normal, tarsal claws with a subapical tooth and small basal lobe. *Abdomen* with sawsheath and saw as in *Priophorus ulmi* L. (Cameron, 1885, 2, plate xiv, fig. 5).

HERTFORDSHIRE, Gaddesdon, 1 ♀, 11.v.1926, R.B.B. (Holotype); DEVONSHIRE, Newton Abbot, 1 ♂, 11.v.1925 (Allotype), 1 ♂, 8.v.1921, and 1 ♀, bred 14.v.1925 from larva ix.1924, R. C. L. Perkins; SUFFOLK, Framlingham, 1 ♀, v.vii.1927, R.B.B.; and CAMBRIDGESHIRE, Milton, 1 ♀, 3.v.1924, R.B.B.

Holotype, allotype and two paratypes in British Museum; ♂ and ♀ paratypes at Oxford.

This species, together with *Priophorus ulmi* (L.), can be distinguished from all other European members of the genus by the form of the upper part of head, especially the temples, which are entirely smooth and shining, without the minute tubercles which occur in all the other species. From *P. ulmi* (L.) it can be distinguished by the dark hind femora, white tibiae, and by the toothed instead of bifid hind claws.

I regard *P. laevifrons* sp. nov., as well as *P. ulmi* (L.) and *P. eradiatus* (Htg.), as belonging to *Priophorus* rather than to *Trichiocampus*, which I restrict to those species in which the basitarsus of the front legs is shorter than the two following tarsal segments together (i.e. *T. viminalis* Fallén, *irregularis* Dyar, *simplicornis* Norton and *gregarius* Dyar).

Unfortunately Rohwer (1922) was wrong in saying that *P. ulmi* (L.), etc., have got saws of the *Priophorus pallipes* (Lep.) form, that is with the lower edge concave and consisting of eight strongly armed sections; *P. ulmi* (L.), etc., have got saws with the straight lower edge bearing twelve or more teeth as in *Trichiocampus viminalis* L., but so also has *Priophorus distinguendus* Enslin, which was always considered a true *Priophorus* only with difficulty, apart from the saws, separable from *P. pallipes* (Lep.) (Conde, 1935, pp. 75 and 85, fig. 4).

Except for the tarsal character it is difficult to separate *Trichiocampus* and *Priophorus* generically; the form of the third antennal segment cannot be relied on (Rohwer, 1922); the social larval habit cannot be used as additional support as *Priophorus aeneus* (Zaddach) has social larvae much as in *T. viminalis* (L.) but has long front basitarsi. In the females it is also difficult to separate *Cladius* and *Priophorus* generically. Unless genera are clearly definable they hinder rather than help, and as there are so few Cladiinae in the world it might be better to regard them all as belonging to a single genus — *Cladius*.

* *Euura venusta* (Zaddach).

At Brickett Wood, Herts, on 15.vi.1929 I captured two ♀♀ and on 17.vi.1936 one ♀ of an *Euura* much larger than *E. saliceti*

Fallén (about 4·5 mm. long instead of 3·5 to 4 mm.), and with the central prominence to the sawsheath longer (when viewed from above), with the hairs it bears on each side directed almost straight backwards instead of being curved. My wife and I also captured 2 ♀ ♀ very similar at Aviemore, Inverness, 2-4.vi.1934, and J. W. Saunt has sent 1 ♀ from Tile Hill, Warwickshire, 17.v.1934. They undoubtedly belong to the European species *E. venusta* (Zaddach), which forms its galls in the leaf-petioles of willows allied to *Salix cinerea* L. It has not been recognised for certain as British before, although the presence of its galls has been suspected.

Amauronematus amentorum (Förster).

This species was recorded as British by Perkins (1929) on the strength of one specimen taken on Dartmoor. There is a second British specimen, a ♀, in the Bridgman Collection at the Norwich Museum: it was taken at Brundall, Norfolk, 27.iv.1879, by J. B. Bridgman and had evidently been shown to Cameron, as it bears a label 'Cameron cannot name.' I am indebted to Mr. F. Leney, of the Norwich Museum, for enabling me to examine this interesting specimen.

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August 10th, 1936.

LARVAE OF A SAWFLY (*TENTHREDOPSIS CARBONARIA* L.) FEEDING AT NIGHT UNTIL EARLY DECEMBER IN SUSSEX.

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Mr. H. M. Edelsten reported to me last autumn that noticing freshly eaten cock's foot grass (*Dactylis glomerata* L.) in his garden at Balcombe, Sussex, one day in the last week of October, 1935, he had gone out into the garden after dusk to discover the cause. Instead of some Noctuid caterpillars, as he had expected, he found sawfly larvae.

The plant of grass was potted and the pot placed in a rhubarb jar and covered with glass, but otherwise left out to the weather. The larvae continued to feed nightly, coming out after sunset and feeding at any rate up till 10 p.m., after which hour he was never in the garden to see them. During the daytime they were found hidden deep down between the bases of the leaves and the roots. This went on until the end of the first week of December, despite cold and frost, and then they finally went down into hibernation.

Three females had emerged and were found alive in the jar on June 10th, 1936, and one male which had emerged a day or two before was already dead. A fourth female emerged about a week later. The male and one female are typical, two females are partially banded with red, while one female has the abdomen black at the base and red at the apex (Benson, 1934).

The evening or night feeding of the sawflies of the tribe Tenthredininae and their partiality for low plants are of course well known, and are no doubt largely the explanation of the paradox that several of the commonest of sawflies, belonging to this subfamily, are rarely met with or are entirely unknown in the larval state; whereas in the Nematinae, mostly attached to trees and shrubs, and especially in the leaf-mining Fenusinae, the larvae are so much more in evidence than the adults! Some species whose larvae, being day-feeders, are apparent and common enough are so difficult to obtain in the adult state that they are generally looked upon as rare species.

The feeding of the larvae so late in the year and at night, when they must have had to withstand frosts, is interesting. Stein (1929) records the larvae of *T. coqueberti* Klug and *scutellaris* F. (=*nassata* L.) as feeding in the evenings in the autumn in Bohemia, but only until the beginning of November.

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British Museum (Natural History),
Cromwell Road, London, S.W.7.
August 10th, 1936.

Lissodema cursor Gyll. : *a black variety at Oxford.*—On the evening of August 3rd, while I was sweeping the mixed herbage under a hedge facing the Cherwell within five minutes' walk of my house, a black Salpingid beetle turned up in the net. At the time I took it to be *Sphaeriestes ater* Payk., a species hitherto unique as regards the Oxford district; but on mounting it a day or two later, the plainly denticulate sides of the pronotum at once suggested *Lissodema cursor;* with the description of this rarity it was found to agree in all particulars except as to colour, which is deep black with a very slight metallic reflection, the antennae and legs being as usual testaceous with slightly darker femora. The only reference I can find to a melanic form of this insect is by G. Portevin (Encyc. Entom. XVIII : Histoire Naturelle des Coléoptères de France, Tome III, p. 111) (1934), by whom *L. cursor* is thus diagnosed—' Pronotum avec 5 dents laterales : noir ou brun, antennes et pattes rouge ferrugineux.' As far as I can ascertain, no example of this striking variation of one of our rarest beetles has hitherto been recorded from the British Islands.—James J. Walker, Aorangi, Lonsdale Road, Summertown, Oxford : *August 18th,* 1936.

Rhizophagus aeneus Richt. in Tilgate Forest.—On May 24th, on the occasion of the Field Meeting of the South London Entomological and Natural History Society, I took a single example of this species under the bark of the stump of a young chestnut tree that had recently been felled. In the same situation were *Librodor quadriguttatus* F. and *L. hortensis* Fourc., the former in considerable numbers as well as the larvae, *Phloeostiba plana* Payk. and *Bitoma crenata* F., while females of *Xyleborus dispar* F. and *X. saxeseni* Ratz. were also burrowing into the stump.—K. G. Blair, 120 Sunningfields Road, Hendon : *August 15th,* 1936.

Synchita humeralis F. at Oxshott.—On May 29th under bark of young burnt birches on Oxshott Heath I took three specimens of *S. humeralis* in company with *Bitoma crenata* F. in plenty. On the same trunks in nodules of the black fungus *Daldinia concentrica* were a number of lepidopterous larvae which subsequently produced *Myelois neophanes* Drnt.—K. G. Blair : *August 15th,* 1936.

Graphocephala coccinea Forst. near Chobham.—This year I have again met with this conspicuous Homopteron in great abundance on Rhododendrons in a plantation near Chobham. I shall be pleased to give specimens to Entomologists who may require the insect, and would willingly act as ' pilot ' to any one who would prefer to take the *Graphocephala* personally.—Lewis F. Barton Peperstrike, Chobham, Surrey : *August 20th,* 1936.

A PRELIMINARY LIST OF THE COLEOPTERA OF WINDSOR FOREST.

BY HORACE ST. J. K. DONISTHORPE, F.Z.S., F.R.E.S., ETC.

TO THE MEMORY OF
FLORENCE JANE KIRK,
WHOSE PATIENCE, SKILL, AND UNFAILING ENERGY
WERE AN INVALUABLE HELP IN ATTAINING THE
RESULTS SET FORTH IN THESE PAGES.

> 'Thy forests, Windsor, and thy green retreats.'—JESSE.

> 'Where is June so joyous as within the courts and halls of peerless Windsor? Where does the summer sun shine so brightly as upon its stately gardens and broad terraces, its matchless parks, its silver belting river, and its circumference of proud and regal towers? Nowhere in the world. At all seasons, Windsor is magnificent; whether, in winter, she looks upon her garniture of woods stripped of their foliage, her river covered with ice, or, in autumn, gazes on the same scene, a world of golden-tinted leaves, brown meadows, or glowing corn-fields. But summer is her season of beauty—June is the month when her woods are fullest and greenest; when her groves are shadiest; her avenues most delicious; when her river sparkles like a diamond zone; when town and village, mansion and cot, church and tower, hill and vale, the distant capital itself—all within view—are seen to the highest advantage. At such a season, it is impossible to behold from afar the heights of Windsor, crowned, like the Phrygian goddess, by a castled diadem, and backed by lordly woods, and with-hold a burst of enthusiasm and delight.'—WILLIAM HARRISON AINSWORTH.

Although a certain number of records of the beetles collected in Windsor Forest and the surrounding district may be found in the works of Stephens, Fowler, and The Victoria County History of Berkshire, and also scattered through various Entomological publications, no attempt has been made up to the present time to classify, and to enumerate as a whole, the Coleoptera of this ancient forest land. The present list can, however, only be regarded as provisional; for although I have constantly investigated and collected in this beautiful Forest during the last fifteen years, and have also endeavoured to bring together the whole of the earlier records, there must still remain very many species to be discovered. The following list contains only such species as I have taken myself, or are vouched for by published records. The total number of species is now 1,819, as against 147 already recorded from Windsor Forest. Of these I have retaken eighty-nine. This synopsis, however, professes to be more than a mere list of names, being written for others as well as for the systematic Coleopterist, to whom the species may be familiar. Thus it is obvious that many of the commoner beetles which destroy wood, etc., or are beneficial, are of more interest and importance to the public than any of our rarest species so dear to the collector. I have therefore added to these, and indeed to most of the species, a short account of the conditions under which they are found.

Although synonymy lies beyond the scope of this publication, I have taken the opportunity of correcting certain errors that have crept into the nomenclature of our British Coleoptera, as well as indicating the names by which the species referred to in the ancient records would be known to-day.* The classification adopted is that of the Catalogue of British Coleoptera by Prof. Sir T. Hudson Beare and myself, published in 1904, which does not differ greatly from that of the standard work on the Beetles of Britain by the late Canon W. W. Fowler.

Among the older entomologists who collected Coleoptera at Windsor in the early part of the last century the following names are prominent:—T. Desvignes, who captured many rare species; J. H. and J. R. Griesbach appear to have done a good deal of work in the Forest, the former being responsible for several very doubtful species; the Rev. F. W. Hope (the founder of the Hope Department in the University Museum at Oxford) evidently collected there, as did also the late E. W. Janson, to whom keys of the gates in the Forest were given, apparently, 'for services rendered.' The celebrated Dr. Leach and the late G. R. Waterhouse also explored the Coleopterous fauna of Windsor. The exact captures, so far as they are known, of all these pioneers of Entomology will be found in the body of this list.

I have endeavoured, at the British Museum (Natural History) (which contains the Stephensian collection of Coleoptera), as well as in the University Museum at Oxford, etc., to trace the actual specimens of the doubtful species (or at any rate such species as have not otherwise been recorded from Britain) included by Stephens (1828-1839) as from Windsor. The later pages of this paper will show that in many instances the search has been successful.

* The reason for this is that the numbers in that Catalogue form the index to the species in my Windsor Forest Pilot Files, and an immense amount of time would be lost in rearranging the whole list.

I may here mention the circumstances in which I came to investigate the Coleoptera of this most interesting locality. As the ant *Acanthomyops* (*Donisthorpea*) *brunneus* Latr. was not uncommon in Windsor Forest, where it inhabits many of the old trees, I determined to attempt the investigation of its life-history. This being accomplished successfully, and the inquiry having incidentally led to the discovery of many rare beetles, I thought it would be of scientific interest to make an intensive study of the Coleoptera of the locality. In this I have been greatly assisted and encouraged by the authorities of the Crown Estate Office, and I desire to take this opportunity of expressing my deep indebtedness to the late Mr. C. Lloyd, Deputy-Surveyor of Windsor Parks and Woods, and Chief of the Crown Estate Office, and to Mr. E. H. Savill, his successor, for all their unfailing kindness and courtesy, and the very valuable help that they, and all their assistants, have always rendered. But for this kind help the present paper could never have been written.

In the course of these investigations I have been fortunate enough to discover thirty-seven beetles new to Britain, including eight species new to science (to be mentioned in their proper places); three Diptera—*Pseudacteon brevicauda* Schmitz (a small fly found with ants), *Neophyllomyza fungicola* Hend. (also with ants), and *Calobata calceata* Fall. (the last-named being a very fine addition), new to Britain; one flea—*Ceratophyllus wickhami* Baker (parasitic on the Grey Squirrel), new to Britain; two aphids—*Stomaphis longirostris* F. (living with the ant *A.* (*D.*) *brunneus*), and a curious stalk-eyed species, new to Britain; some eight parasitic Hymenoptera, and two mites—*Antennophorus* n.sp., and *Laelapsis* n.sp. (Acari living with *A.* (*D.*) *brunneus*), new to science. I have also retaken certain Coleoptera recorded from Windsor nearly one hundred years ago. Some of these are:—*Agrilus sinuatus* Ol., *Elater nigerrimus* Lac., *E. coccinatus* Rye, *Ludius ferrugineus* L., *Ischnodes sanguinicollis* Pz., *Megapenthes tibialis* Lac., *Lymexylon navale* L., and *Scraptia fuscula* Müll.

Many species of beetles which are characteristic of the New Forest and of Sherwood Forest also occur in Windsor Forest. Such similarities are to be expected, inasmuch as all three localities are ancient forest lands. It is, however, interesting to note that several of the Windsor Forest species have only been found in one of the other two localities, as is illustrated by examples in the following list:—

	Windsor Forest.	New Forest.	Sherwood Forest.
Eucnemis capucina Ahr. - -	+	+	–
Teredus nididus Shuck. - -	+	–	+
Euplectus nubigena Reitt. - -	+	–	+
Cryptocephalus querceti Suffr. -	+	–	+
Quedius aetolicus Kr. - -	+	+	–
Lymexylon navale L. - -	+	+	–
Synchita juglandis F. - -	+	+	+
Rhizophagus oblongocollis Blatch.	+	–	+

The first five of these species and the last one have only been found in Britain in the localities marked + ; of the last three, *Lymexylon* has not been found elsewhere for many years, and *Synchita* is practically confined to the three localities.

Brief mention must be made of certain other insects with which beetles are associated.

The ant *A*. (*D.*) *brunneus,* already referred to, is rather common and inhabits many different kinds of trees. The other tree-ant, *Acanthomyops* (*Dendrolasius*) *fuliginosus,* a shining black species which marches in files, occurs at Swinley, Rapley, etc., but not in the same spots as *brunneus.*

The 'hill ant' *Formica rufa,* which may be found building its hillocks of pine-needles, etc., in Swinley Forest, etc., used formerly to occur nearer to Windsor, but has not been seen recently.

Both *Acanthomyops* (*Chthonolasius*) *umbratus* Nyl. and *A.* (*C.*) *mixtus* Nyl. occur, nesting at the foot of and in the wood mould of hollow trees; their curious Acarid guests, *Antennophorus uhlmanni* Hal., *Uropolyaspis hamuliferus* Mich., and *Sphaerolaelaps holothyroides* Leon., are usually present with them. We once found a mixed colony of *A.* (*C.*) *umbratus* and *A.* (*D.*) *brunneus,* showing that a ♀ *umbratus* had founded her colony in the *brunneus* nest; its usual hosts of course being *A.* (*D.*) *niger* L. and *A.* (*D.*) *alienus* Först.

Trees tunnelled by the larva of the Goat-moth (*Cossus cossus*) are present, but not nearly so commonly as in former years. Wasps are abundant, especially the species making nests in the ground, although those nesting in trees also occur; and one occasionally finds hornets' nests in old trees. The following observations on the hornets of Windsor Forest are perhaps not without interest. A colony had constructed its nest in a hole in the bough of an old oak, part of the comb being exposed, but flush with the surface. The nest and comb-material, or 'paper,' of this colony was not grey like that of most hornets and wasps, but yellow, exactly matching the bare surface of the bough from which the bark had disappeared. Hence the comb escaped the eye, and was even difficult to detect when the position of the nest was known. It is possible that this resemblance was not accidental, but that the hornets, for constructing the paper-like fabric of the comb, had selected wood of a colour which matched the surroundings of the nest.

The woodmen at Windsor have informed me that young ash-stems are 'ringed' by hornets gnawing round them with their mandibles. We have since found such ringed stems. I think it is probable that the object of this habit is to obtain juice from the young bark as well as to provide the dead wood used in constructing the nest. A nest which I found in a hollow beech was guarded by a hornet posted like a sentinel at the entrance, a hole in the comb so small as to admit only one at a time. When a 'homing' hornet arrived, it settled on the nest and crawled up to this hole, the sentinel after due inspection withdrew and permitted the new-comer to pass, but immediately resumed its duties at the entrance. I was reminded of the behaviour of certain ants (species of *Colobopsis*, a subgenus of *Camponotus*) whose soldiers, having circular flattened heads exactly fitting the entrance-holes, actually provide the front-doors of the nest. This habit, which is known as phragmotic (*i.e.* closes the nest entrance with the anterior part of the head), is of course a more perfect arrangement than that of the hornet; for when the entrance is blocked by the ant's head it becomes invisible.

No special search has been made for butterflies and moths (this, of course, only refers to ourselves), but a number of the former have been noted. Of these one may mention — a single specimen of the Camberwell Beauty (*Nymphalis antiopa*) was seen flying across a Sphagnum swamp (9.viii.32); this, however, was probably an individual that had been liberated. The Purple Emperor (*Apatura iris*) may be sometimes observed flying over the tops of high oaks. The White Admiral (*Limenitis camilla*) occurs in several localities, and the Red Admiral (*Vanessa atalanta*), Peacock (*Nymphalis io*), Painted Lady (*Vanessa cardui*) and Small Tortoiseshell (*Aglais urticae*) are generally common and sometimes abundant. The Brimstone (*Gonepteryx rhamni*) is not uncommon on the wing early in the year.

Of the Fritillaries, the Pearl Bordered (*Argynnis euphrosyne*), the Silver Washed (*A. paphia*), the High Brown (*A. adippe*), and the Dark Green (*A. aglaia*) are not uncommon at bramble blossoms, etc. A form of the Grayling (*Eumenis semele*) which we have taken in Windsor Forest is possibly a local race.

The following additional species have been taken or noted by us:—The Large White (*Pieris brassicae*), the Small White (*P. rapae*), the Green-veined White (*P. napi*), the Orange-tip (*Euchloë cardamines*), the Comma (*Polygonia c-album*), the Wall Brown (*Pararge megera*), the Meadow Brown (*Maniola jurtina*), the Gate-keeper (*M. tithonus*), the Ringlet (*Aphantopus hyperanthus*), the Small Heath (*Coenonympha pamphilus*) the Green Hairstreak (*Callophrys rubi*), the Small Copper (*Lycaena phlaeas*), the Silver-studded Blue (*L. aegon*), the Holly Blue (*Lycaenopsis argiolus*), the Small Blue (*Cupido minimus*), the Small Skipper (*Adopaea sylvestris*), and the Large Skipper (*Ochlodes venata*).

Of the moths — the Broad Bordered Bee Hawk Moth (*Haemorrhagia fuciformis*) and the Yellow-legged Clear-wing (*Aegeria vespiformis*) have been taken by us. The Wood Leopard (*Zeuzera pyrina*) occurs, and its larvae are found in the stems of young elms, etc. The larva of the Elephant Hawk Moth (*Pergesa elpenor*) has been swept up. The beautiful Cream-spot Tiger Moth (*Arctia villica*) has been met with, and we have beaten the Buff Footman (*Lithosia deplana*) off burnt pines

In other orders, one may mention in the Diptera—*Arrhinomyia cloacellae* Kram., *Psilota anthracina* Mg., *Calliprobola speciosa* Rossi, and *Pocota apiformis* Shr., all rare insects. The last-named beautiful species was bred in some numbers from its ' rat-tailed ' larvae, taken in a damp rotten beech trunk.

The deer-fly (*Lipoptena cervi* L.) sometimes occurs in numbers on the wing, and settling on one's clothes, and its shining black puparium occurs in the straw in deer-pens.

The Trichopteron *Stenophylax dubius* Steph., of which a male, and subsequently a female, were swept on the banks of a small stream, is a very rare insect, only the type specimen, a male, having been found heretofore in Britain.

A number of Sawflies has been taken. Some of those most worthy of mention are — *Xiphydria camelus* L., a very curious-looking creature, found at rest on cut timber; *Xyela julii* Bréb., *Ametastegia albipes* C. G. Th., *Dolerus nitens* Zadd., *Selandria fürstenbergensis* Know., and *Amauronematus meltonatus* Zadd. The third British specimen of *Diprion polytomum* Ktg. was beaten off spruce. Fortunately no others have been found, as it may become a serious pest. It has been introduced from Europe into Canada, where it has caused immense damage in the spruce forests.

A number of noteworthy Heteroptera and Homoptera has been taken. The ant-like larval stage of *Alydus calcaratus* L. has been found running in company with workers of *F. rufa* L., *F. fusca* and other ants. *Ischnodema sabuleti* Fall. was first taken in a swan's nest, and subsequently swept in some numbers off reeds and other water-plants. The large water-bug *Ranatra linearis* L. occurs in some of the ponds. We made the following observations on the swimming of this creature at Windsor Forest: 'The bug appeared to stand on the water in a slanting position, and using the front legs like a dog swimming and striking out with the back legs, it rushed forward, looking like a minature motor-boat. One speciment swept out and round in a great circle; another went right across the large pond in an incredibly short time, leaving a regular wave, as if from a steamboat, in its wake. The day was warm and sunny, which probably stimulated the creatures, and it looked as if they were taking this exercise purely for pleasure. In the aquarium they are very sluggish and remain submerged beneath the surface of the water.'

Other species worthy of mention are *Corizus maculatus* Fieb., *Aphanus pini* L., *Metatropis rufescens* H.S., *Aradus depressus* F., and *Cardiastethus fasciiventris* Garb.

The large and curious Homopteron *Ledra aurita* L. is found in all its stages by beating hawthorn, oak, etc. We have kept live Windsor specimens at the Natural History Museum, but neither its life-history nor its food is yet known for certain.

Two spiders are of interest, chiefly on account of their unusual habitat. *Meta menardii* Latr., known as the 'Cave Spider,' is a large species which we have found in some numbers in the centre of great trees, oak, beech, etc., after they have been cut down. This spider inhabits caves and extends throughout the mountain limestone districts of England (from Devon to the N. Riding of Yorkshire) and Ireland, but there was no previous record for the South-East of England. The other species, *Tegenaria atrica* C.L.K., constructs large matted webs inside hollow trees in the forest. This spider, usually confined to houses, is nearly related to the 'Hampton Court' or 'Cardinal' spider, *T. parrectina* Fourc.

Windsor Forest may be said to extend from Windsor to Camberley, and to include Windsor Great Park, Windsor Forest and Swinley Forest. The area, therefore, contains the town and the immediate neighbourhood of Windsor. The Park is open to the public on condition that there is no interference with or damage to the trees, or any infringement of the regulations printed on the notice-boards at the gates. In connection with this subject we regret to have observed an unfortunate result of the kind permission to picnic beyond the roadside among the trees. Not only is much unsightly litter left behind, and hollow trees filled with empty bottles, tins, et., but two valuable old trees have been set on fire, one of them being totally destroyed!

Before entering on the main subject of this paper, it seems desirable to point out, and briefly describe, some of the interesting features of this delightful spot.

Formerly when strolling through the Park one sometimes met a beautiful flock of white (Angora) goats, and it is interesting to observe that their visits to different parts of the Park were determined by the state of the weather. It is perhaps not generally known that this flock is the source whence the Royal Welsh Fusiliers obtain their mascot. By an ancient custom the regiment can, when necessary, claim one or more of these goats, which are of course taken quite young and trained to march with the band. These goats, however, are no longer allowed to be at large in the Park.

All the deer found in the Forest in 1817 or 1818 were surrounded and driven into the Park, where they have given rise to the existing large herds of both fallow and red deer. The red deer are particularly fine, and present a most imposing spectacle when one suddenly comes across a number, with well-developed and spreading antlers, all standing 'at gaze.' The Windsor deer seem to me to be in better condition, and finer, than any I have seen elsewhere, largely due, I believe, to the improvement of the pasturage during recent years.

Highland cattle were formerly kept in the Park, and fortunately they have recently been reintroduced, and form a picturesque addition to the landscape.

The North American grey squirrel has established itself at Windsor for several years. Although undoubtedly an interesting addition to our fauna, and an ornament to the London parks, it is much to be regretted that the invader has extended its range so widely and in such numbers throughout the country.

Pheasants are reared every year in the Park and Forest, although, unfortunately, the soil does not appear altogether to suit this beautiful and useful bird.

In the nineties of the last century a Golden Eagle was captured in Windsor Great Park. It was confined in a wire enclosure at the rear of Cranbourne Tower (William IV's shooting box), where it lived for many years. It can still be seen, stuffed, in a glass case in one of the rooms of this tower. The celebrated race-horse ‘ Eclipse ’ is buried near this tower, the spot being marked with an iron tablet. In the Herefordshire Cattle Farm-house is a stuffed Genet, which was shot in Windsor Forest some time ago, probably an escape from some travelling menagerie or circus.

The Woodcock is known to have nested recently in the Forest, thus creating the second record for Berkshire. Many other interesting birds are of course present. The Nuthatch and the large Green Woodpecker are both common, and one may also see the Lesser Spotted Woodpecker. The presence of the Crossbill has been recorded near Ascot, and the Grasshopper Warbler is sometimes heard in the spring. Owls are not uncommon and deserve to be encouraged for the sake of the benefit they confer in keeping down rats, mice, and other vermin ; as do also the Kestrels, which may sometimes be seen on the wing round the tops of the larger trees. The Redstart, a bird which as I am informed has become much scarcer elsewhere, is quite holding its own, nesting in the old oaks at Windsor. A heronry used to exist near Sandpit Gate, but in 1859 the birds were disturbed and moved to the opposite side of the lake at Virginia Water. Here they were unfortunately again disturbed and have now disappeared, though one frequently sees one or two round the ponds and on the wing. Swans nest regularly on the ponds and lakes, and we have seen the Great Northern Diver on Cumberland Lake (where so many water-fowl occur) in the autumn.

A vine which is larger than that at Hampton Court, and probably the largest in the world, grows in the gardens at Cumberland Lodge, producing 1,200 bunches of grapes yearly. It occupies a vinery 138 feet long by 22 feet wide.

It is well known that in spite of tradition the mistletoe rarely grows on the oak. A single example of this uncommon association exists in the forest. There is also a rambler-rose bearing mistletoe near the Castle in the gardens of Queen Adelaide’s Cottage.

The celebrated oak of ‘ Herne the Hunter ’ no longer exists. It formerly stood in the Home Park, but was blown down in 1863. The spot where it grew is marked by a tablet fixed to a young tree planted by Queen Victoria. It may be of interest to mention a few of the oldest and most celebrated trees. The largest tree in the Forest is an oak about 40 feet in circumference, to be seen between Forest Gate and Highstanding Hill. William the Conqueror’s Oak, in the White Deer Enclosure at Cranborne, is a grand old tree which has borne that name for many centuries, and is believed to be between 1,200 and 1,500 years old. The main stem disappeared long ago, but the portion now standing is one of the side branches, which still shows signs of vigorous life. Of the four trees named after, and chosen by, four of our Queens, the furthest west from Windsor is Queen Charlotte's Oak, a fine tree about 500 years old, growing in Bray Wood. Near to it in the same wood is Queen Anne's Oak, about 470 years old. Queen Victoria's Oak near Highstanding Hill was chosen by Her Majesty as her favourite tree, shortly after her accession. It is probably about 320 years old. Finally, Queen Adelaide's Beech, about 200 years old, stood to the east of Queen Victoria's Oak. This tree was recently blown down, and Her Majesty Queen Mary has planted another beech in its place. A very fine beech in the grounds of Queen Adelaide's Cottage is known as 'Luther's Tree,' having been raised from seed collected from a tree growing on the spot where the great reformer was arrested. Queen Adelaide left this tree in her will to Queen Victoria. Its seeds recently sown in the Park Nursery and transplanted in the Preserves near Virginia Water Lake, within the Great Park, are expected to give rise to a plantation which, like the parent tree, will be associated with the name of Luther.

Close to Ascot Gate is the Parish Boundary Oak, a fine large tree still bearing the mark imprinted on it during the ceremony of 'beating the bounds.'

Before closing this brief account of a few of the trees, mention must be made of the two fine elm avenues. Of these the Long Walk is especially worthy of notice. This noble avenue, containing nearly 2,000 trees, extends for a total length of two and seven-eighths miles, from Windsor Castle to the 'Copper Horse', (the statue of King George III) on Snow Hill. It was commenced in 1680 by the Duke of York and completed by William III. The other avenue is known as Queen Anne's Ride, having been planted during her reign. It is a grassy drive and extends for about three miles from Queen Anne's Gate to Prince Consort Gate. There are also several very fine avenues of lime trees.

(*To be continued.*)

Lissodema cursor Gyll. in Sussex.—I have taken three specimens of this insect at Barcombe by beating the dead ends of branches of trees, viz. on 23.vi.26, 24.vii.29 (oak), 25.vi.33 (ash). The latest specimen is black: the other two are brown. Reitter (Fauna Germanica, 1911) gives the colour of the insect as 'black or brown.'—C. J. SAUNDERS, Barcombe Mills, Sussex: *September 1st*, 1936.

ANCHONIDIUM UNGUICULARE AUBÉ IN CORNWALL.

BY E. C. BEDWELL, F.R.E.S.

In the April number of this magazine (*ante*, 78) Dr. R. T. Bannister records his capture of two specimens of the above-named species in a wood near Gweek, Cornwall.

Whilst staying in the county last April, Dr. Bannister informed me of his capture, and showed me one of the specimens. On the 29th of the month, a bright sunny day, I paid a flying visit to Gweek and found a wood of oaks entirely bare of leaf; I set to work sifting dead leaves — not a beetle did I see, but plenty of centipedes, millipedes, etc. Fortunately, I placed the unpromising siftings in a bag and, moving on about a quarter of a mile, repeated the process.

It was not until my return from Cornwall that I worked through the siftings. To my surprise I found twenty-seven specimens of the *Anchonidium*. They were very difficult to see, being the colour of the earth, extremely quiescent, and tobacco smoke appeared to have little effect. Although the whole of the siftings only covered the bottom of an ordinary pail to a depth of two inches, it took me five hours to work it through, as I had to examine a tablespoonful at a time.

I was not satisfied on completion that I had secured all the beetles, so a few days later I again went through the siftings; seven further examples occurred, making a total of thirty-four.

It would appear that the species is locally abundant but overlooked, or that I accidentally struck upon its headquarters in one or other of the two spots I worked.

54 Brighton Road,
Coulsdon, Surrey.
August, 1936.

CIS SAVILLI N.SP., A SPECIES OF COLEOPTERA NEW TO SCIENCE.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

Department of Entomology, British Museum (Natural History).

Dark brown, anterior portion of thorax yellowish, clypeus and legs brownish-yellow, antennae entirely pale yellow. Body clothed with semidecumbent short yellow scale-like pubescence.

Head, with eyes, not as broad as the thorax at anterior angles; ***clypeus*** round anteriorly, straight posteriorly; *eyes* rather prominent. ***Thorax*** rounded and narrowed anteriorly, broadest about middle, slightly narrowed to base; ***posterior angles*** obtuse, ***posterior*** and ***side margins*** narrowly bordered, the latter without bristles; puncturation fine and shallow. ***Elytra*** twice as long as thorax, and 1⅔ longer than together broad, as broad at base as base of thorax, punctured with larger and smaller punctures, the larger ones forming somewhat irregular rows. *Long.* 1.52 mm. (elytra 1 mm., thorax 0.5 mm.).

Type in Coll. Brit. Mus.

Named in honour of Mr. E. H. Savill, Deputy-Surveyor of Windsor Parks and Woods.

On June 9th last, when sweeping *Carex canescens* (White Sedge) in a Sphagnum swamp in Windsor Forest, I captured a small *Cis*, which I did not recognise.

As neither Dr. Blair nor I could name this insect, either with the aid of the literature or the collections at the Museum, I sent it to Mons. Maurice Pic, who was kind enough to examine it for me. He considers it to be a new species, there being nothing like it either in his own collection or that of Reitter, and that it perhaps comes nearest to *C. reflexicollis* Ab., from which it differs in puncturation, pale antennae, etc. The puncturation separates it from *festivus* and our other small species. No further specimens have been found, and no fungi suitable for *Cis* occur nearby. Its occurrence on the sedge can only have been accidental.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
September 17th, 1936.

A NEW SPECIES OF *PROTERHINUS* (COL. RHYNCH.) FROM THE MARQUESAS ISLANDS.

BY R. C. L. PERKINS, D.SC., F.R.S.

Proterhinus unicolor sp. n.

Ferrugineus, subaequaliter aureo-squamosus, elytris postice setis erectis, albis, minutissimis parcissime vestitis. Antennae elongatae, elytris longitudine aequales, articulis omnibus elongatis. Pronotum angustum, quasi elongatum, fortissime denseque punctatum, punctis quam elytrorum majoribus. Elytra subscutiformia, angulis humeralibus distinctis, fere rectis. ♂. Long. 2.25 mm.

This species is of the same red colour as is often noted in Hawaiian forms that frequent tree-ferns and *Euphorbia*. The single example collected may be slightly immature, but it shows no sign of black or dark markings. The head, seen from in front, has the face short and wide, the eyes large and very strongly convex, the antennae elongate, each joint being more or less so, the 8th shorter than the 7th and also considerably shorter and less wide apically than the 9th, which forms the base of the slender, elongate club. The pronotum is narrow, with gently rounded sides, the golden appressed clothing almost evenly distributed over the surface between the very coarse punctures and not forming denser patches at the sides or hind angles; it is without depressions or any definite anterior constriction such as are often seen in Hawaiian species. The elytra are wide at the base, convex, without ridges or basal tubercles, the humeral angles distinct though hardly produced, the sides nearly parallel from the base to about the middle, when they become convergent, so that the elytral form is shield-shaped; the appressed golden clothing is not dense, nor does it form maculae; the erect setae are extremely few, white and very minute, placed on the posterior part of the wing-cases between the suture and the marginal fringes, and only seen on close inspection in this specimen; there is a vague median impression basally behind the scutellum, but this may not be a constant character. The antennae and legs are concolorous with the rest of the body, and the latter present no striking characters, the lobes of the front feet being normal, but rather large, and the erect setae of the hind tibiae very short.

This is certainly distinct from the two Marquesan species previously described by me, the form of the head, pronotum and antennae being more like that of *mumfordi*, which differs in the extraordinarily modified lobe of the front and middle tarsi, and in the shape of the elytra. From *P. adamsoni* the form of the head, pronotum and elytra will readily separate it. Unfortunately, I do not know whether the Marquesan species are as liable to structural aberration as the Hawaiian, since I have had only four specimens from which to describe my three species, and consequently the female sex of two of these is at present unknown.

Hab.: MARQUESAS Is.; Fatuhiva. Beaten from tree-fern at 2,000 ft., 31.i.25 (*C. L. Collenette* : St. George Expedition).

Newton Abbot.
September 20th, 1936.

A NEW SPECIES OF *XANTHOPHAEA* (COLEOPTERA: CARABIDAE) FROM NEW CALEDONIA.

BY EVERARD B. BRITTON, M.SC., F.R.E.S.
(Department of Entomology, British Museum (Natural History).)

The genus *Xanthophaea* is distinguished from other Lebiini on the following characters: tarsi pilose dorsally; ligula with only four setae at the apex; mentum dentate; elytra not pilose, except for the setae on intervals 1 and 9.

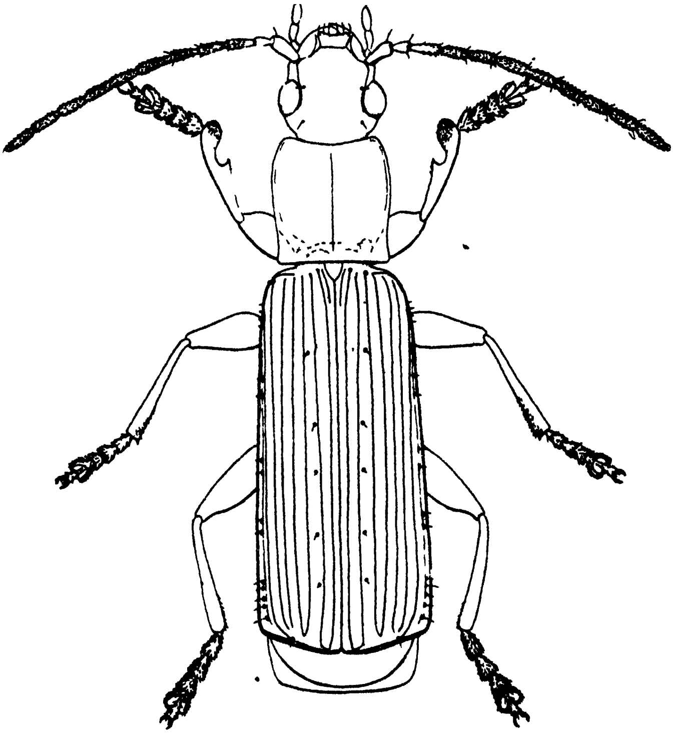
Xanthophaea satanas sp. n.

Length. 14.5 mm.—15 mm.

Colour. Shining black; labrum and anterior edge of the clypeus brown; mandibles and palpi dark brown, the latter paler at the tips; legs black with the tarsi brown; ventral surface dark brown.

Head. Smooth, with a slight depression on each side anteriorly; antennae pubescent from the middle of the third joint onwards; labrum emarginate in front, slightly sinuate at the sides.

Prothorax. Middle length 2.73 mm.; width across the anterior angles 2.0 mm.; middle width 2.52 mm.; width across the hind angles 2.45 mm. Anterior edge moderately concave; anterior angles slightly advanced and rounded; sides almost parallel, very slightly sinuate above the posterior angles, which are rounded; hind edge straight; median line impressed, extending from apex to base; basal foveae shallow, connected by a depression across the base; disc with faint transverse wrinkles; the extreme edges laterally and around the angles in the form of a raised line.



Xanthophaea satanas sp.n. × 6.

Elytra. Length 8.8 mm.; greatest width (near apex) 3.7 mm. Elongate and almost parallel-sided; widening slightly from base to apex; apices obliquely truncate, angles rounded; striae impressed, unpunctured; intervals almost plane, with very small widely scattered punctures; five large setigerous punctures on the third interval.

Legs. Tarsal joints pubescent above, squamulose beneath; fourth tarsal joints bilobed; claws each with four small teeth.

Locality. CENTRAL NEW CALEDONIA: 20.xi.14 (*P. D. Montague*), two examples.

One of the specimens is of a uniform brown colour but resembles the type in all other respects. It is undoubtedly an immature individual, the normal colour being black.

Five species of *Xanthophaea* are known from New Caledonia, all of them described by Fauvel (Rev. d'Ent., I, 1882, p. 254). The largest of these is only 9-10 mm. in length.

British Museum (Natural History),
Cromwell Road, London, S.W.7.
September 18*th*, 1936.

THE PARASITES OF BRITISH BIRDS AND MAMMALS. X. RECORDS OF MALLOPHAHGA FROM BIRDS.[*]

BY GORDON B. THOMPSON.
(Department of Entomology, British Museum (Natural History).)

The species of Mallophaga recorded in this note are arranged under their genera according to Harrison's 'Genera and species of the Mallophaga.'[†] I should like to take this opportunity of thanking all those people, whose names appear in brackets after the locality of each host, for their kindness in sending me these parasites.

MALLOPHAGA.

AMBLYCERA.

MENOPONIDAE.

1. *Menopon albofasciatum* Piaget.
    Tadorna tadorna (Linn.) (Sheld-Duck), Cheshire, Ince, 10.xii.1932 (*H. Bostock*).
2. *M. giganteum* Denny.
    Columba oenas Linn. (Stock Dove), Surrey, Wormley Hill, 4.vi.1935 (*N. H. Bennett*).
3. *M. perdicis* Denny.
    Perdix p. perdix (Linn.) (Partridge, ♂), Glamorgan, Aberthaw, 9.ii.1935 (*J. G. Williams*).
4. *M. pustulosum* Nitzsch.
    (*a*) *Morus bassanus* (Linn.) (Gannet, young), Devon, Plymouth, 19.xi.1935 (*Miss M. Rothschild*).
    (*b*) Same host, Grassholm Is., viii.1934 (*H. M. Hallett*).
5. *Menacanthus curuccae* (Schrank), 1 ♀.
    Parus caeruleus obscurus Pražák (Blue Tit), Denbighshire, Old Colwyn, 8.xi.1935 (*M. Mitchell*).

[*] No. IX appeared in this Magazine for July, 1936, pp. 159-161.

[†] Parasitology, IX, 1916, pp. 1-159.

6. *M. spiniferus* (Piaget).
   (*a*) *Turdus m. merula* Linn. (Blackbird), Denbighshire, Old Colwyn, 21.ix.1935 (*M. Mitchell*).
   (*b*) Same host, Dorset, xi.1935 (*Dr. T. Hare*).
7. *Myrsidea cucullaris* (Nitzsch).
   Sturnus v. vulgaris Linn. (Starling), Essex, Layer Marney, 1.vi.1934 (*Dr. J. W. Campbell*).
8. *Dennyus truncatus* (Olfers).
   Apus a. apus (Linn.) (Swift), Monmouth, Peterstone Wentloog, 18.vii.1934 (*H. M. Hallett*).
9. *Eureum cimicoides* (Nitzsch), 1 ♀.
   Apus a. apus (Linn.), Glamorgan, Cardiff, 16.v.1923 (*H. M. Hallett*).

ISCHNOCERA.

Philopteridae.

10. *Goniodes chelicornis* Nitzsch.
    Tetrao u. urogallus Linn. (Capercaillie), East Lothian, Aberlady, x.1935.
11. *G. damicornis* Nitzsch.
    Columba p. palumbus Linn. (Wood Pigeon), Flint, Caerwys, 21.viii.1935 (*M. Mitchell*).
12. *Goniocotes chrysocephalus* Geibel.
    (*a*) *Phasianus colchicus* Linn. (Pheasant), Cheshire, Congleton, 30.iv.1928 (*A. J. Sotley*).
    (*b*) Same host, Lancashire, Longton, Preston, 10.ii.1923 (*P. A. Heathcote*).
13. *G. bidentatus* (Scopoli).
    Columba oenas Linn. (Stock Dove), Surrey, Wormley Hill, 4.vi.1935 (*N. H. Bennett*).
14. *Lagopoecus affinis* (Children).
    Lagopus s. scoticus (Latham) (British Red Grouse), Radnorshire, Llanbwchllyn, 4.ii.1935 (*J. G. Williams*).
15. *Philopterus acanthus* (Giebel).
    Haematopus ostralegus occidentalis Neuman (Oyster Catcher), Glamorgan, Aberthaw, 9.xii.1934 (*H. M. Hallett*).
16. *P. alcedinis* (Denny).
    (*a*) *Alcedo atthis ispida* Linn. (Kingfisher), Hereford, 30.ix.1934 (*J. S. Stewart*).
    (*b*) Same host, Glamorgan, Cardiff, 31.x.1934 (*J. G. Williams*).

17. *P. auratus* (Nitzsch).
    Scolopax r. rusticola Linn. (Woodcock, ♀), Glamorgan, Llanedarne, 22.ii.i1935 (*J. G. Williams*).
18. *P. cordiceps* (Piaget).
    Calidris c. canutus (Linn.) (Knot), Monmouth, Peterstone Wentloog, 24.xi.1934 (*J. G. Williams*).
19. *P. gonothorax* (Giebel).
    (*a*) *Larus a. argentatus* Pont. (Herring Gull), Glamorgan, Llanishen, 22.x.1934 (*J. G. Williams*).
    (*b*) *Larus c. canus* Linn. (Common Gull), Denbighshire, 27.xii.1934 (*M. Mitchell*).
    (*c*) *Rissa t. tridactyla* (Linn.) (Kittiwake Gull), Essex, Layer Marney, 27.xii.1934 (*Dr. J. W. Campbell*).
20. *P. humeralis* (Denny).
    Numenius p. phaeopus (Linn.) (Whimbrel), Monmouth, Paleston, v.1934 (*H. M. Hallett*).
21. *P. melanocephalus* (Nitzsch).
    Sterna h. hirundo Linn. (Common Tern), Norfolk, Wells, 3.ix.1934.
22. *P. merulae* (Denny).
    (*a*) *Turdus m. merula* Linn. (Blackbird), Surrey, Selsdon, iii.1935 (*A. M. Low*).
    (*b*) Same host, Glamorgan, Radyr, 19.iii.1935 (*J. G. Williams*).
23. *P. picae* (Denny).
    (*a*) *Pica p. pica* (Linn.) (Magpie), Essex, Layer Marney, 29.iii.1934 (*Dr. J. W. Campbell*).
    (*b*) Same host species, Cheshire, Eaton Hall, 17.iii.1933 (*E. G. Williams*).
24. *P. pustulosus* (Nitzsch).
    Stercorarius parasiticus (Linn.) (Arctic Skua), East Lothian, Aberlady, 12.ix.1935 (*G. B. Thompson*).
25. *P. sturni* (Schrank).
    (*a*) *Sturnus v. vulgaris* Linn., Lancashire, Radcliffe, 1.iii.1931 (*T. Warwick*).
    (*b*) Same host species, Essex, Layer Marney, 1.vi.1934 (*Dr. J. W. Campbell*).
    (*c*) Lancashire, Longton, 8.ii.1923 (*W. H. Heathcote*).
26. *Icidifrons pertusus* (Nitzsch).
    Fulica a. atra Linn. (Coot), Radnorshire, Llanbachlly Pool, 18.ix.1934 (*J. G. Williams*).

27. *Cummingsiella testudinaria* (Denny).
    Numenius a. arquata (Linn.) (Curlew, ♀), Glamorgan, Aberthaw, 23.ii.1935 (*J. G. Williams*).
28. *Anatoecus cygni* (Denny).
    Cygnus b. bewickii Yarr. (Bewick's Swan), Cheshire, Marbury Mire, 5.iv.1924 (*T. A. Coward*).
29. *A. icterodes* (Nitzsch).
    (*a*) *Nyroca m. marila* (Linn.) (Scaup-Duck, ♀), Glamorgan, near Cardiff, Rumney Flats, 2.ii.1935 (*J. G. Williams*).
    (*b*) *Anas c. crecca* Linn. (Teal, ♀), Monmouth, Peterstone Wentloog, 30.x.1934 (*J. G. Williams*).
    (*c*) *Anser albifrons* (Scopoli) (White-fronted Goose), Brecon, Garth, 6.xii.1934 (*J. G. Williams*).
    (*d*) *Tadorna tadorna* (Linn.), Cheshire, Ince, 10.xii.1932 (*H. Bostock*).
30. *Degeeriella cingulata* (Nitzsch).
    Limosa l. lapponica (Linn.) (Bar-tailed Godwit), Monmouth, Peterstone Wentloog, 9.ix.1934 (*J. G. Williams*).
31. *D. haematopi* (Denny).
    Haematopus ostralegus occidentalis Neumann (Oyster Catcher), Glamorgan, near Aberthaw, Leys, viii.1934 (*H. M. Hallett*).
32. *D. latirostris* (Burmeister).
    Cuculus c. canorus Linn. (Cuckoo), Glamorgan, Penylan, 21.v.1934 (*H. M. Hallett*).
33. *D. nebulosa* (Burmeister).
    Sturnus v. vulgaris Linn., Cheshire, Blakeden, 9.iv.1930 (*A. W. Boyd*).
34. *D. normifer* (Grube).
    Stercorarius parasiticus (Linn.), East Lothian, Aberlady, 12.i.1935 (*G. B. Thompson*).
35. *D. ornata* (Grube).
    Rissa t. tridactyla (Linn.), Essex, Layer Marney, 27.xii.1934 (*Dr. J. W. Campbell*).
36. *D. podicepis* (Denny), 1 ♀.
    Podiceps r. ruficollis (Pall.) (Little Grebe), Radnorshire, Boughrood, 21.ix.1934 (*J. G. Williams*).
37. *D. rallina* (Denny), 1 ♂.
    Rallus a. aquaticus Linn. (Water Rail), Monmouth, Peterstone Wentloog, 26.xii.1934 (*J. G. Williams*).

38. *D. strepsilaris* (Denny).
    Arenaria i. interpres (Linn.) (Turnstone), Glamorgan, Aberthaw, 26.viii.1934 (*H. M. Hallett*).
39. *Columbicola columbae* (Linn.).
    (*a*) *Streptopelia t. turtur* (Linn.) (Turtle Dove), Glamorgan, Rumney, 26.vi.1934 (*H. M. Hallett*).
    (*b*) *Columba oenas* Linn., Surrey, Wormley Hill, 4.vi.1935 (*N. H. Bennett*).
40. *Anaticola tadornae* (Denny).
    Tadorna tadorna (Linn.), Cheshire, Ince, 10.xii.1932 (*H. Bostock*).
41. *A. crassicorne* (Scopoli).
    (*a*) *Nyroca f. ferina* (Linn.) (Pochard), Radnorshire, Llanbwchllyn Lake, 1.iii.1935 (*J. G. Williams*).
    (*b*) *Melanitta n. nigra* (Linn.) (Common Scoter), Denbighshire, Llandulas, 18.ii.1935 (*M. Mitchell*).
42. *Pectinopygus bassanae* (Fabricius).
    (*a*) *Morus bassanus* (Linn.), Devon, Plymouth, 19.xi.1935 (*Miss M. Rothschild*).
    (*b*) Same host species, Grassholm Is., viii.1934 (*H. M. Hallett*).

British Museum (Natural History),
Cromwell Road, London, S.W.7.
September 18th, 1936.

Cathartus (*Ahasverus*) *advena* *Waltl in the open*.—Fowler (Col. Brit. Isles, **3**, 1889, 305) writes respecting this beetle: 'In rice, etc.; very rarely found out of doors; an introduced species; . . . Mr. Waterhouse has found three specimens under cut grass at Wandsworth.' It was taken by Mr. B. S. Williams in heaps of dry cut grass at Harpenden (Ent. Mo. Mag., **62**, 1926, 94). In the August number of this Magazine (*antea*, p. 178) Mr. C. J. Saunders records it as being fairly plentiful under haystacks in the open in Sussex.

I can now record it as occurring in the utmost profusion in the bottom of a haystack in Windsor Forest. Dozens fell on the paper from every handful of hay shaken over it. It must have been present literally in tens of thousands. The point is, how did it get there, and whence did it come? It was certainly not there last year, as I worked the same haystack for a *Leptacinus* about which I shall have something to say later. The stack consists of hay from the very large field in which it stands, miles away from any granaries, warehouses and the like. A few cottages at some distance are the only buildings of any kind anywhere near.

The European Catalogue of Heyden, Reitter and Weise (1906) gives *Ahasverus* Gozis as a subgenus of *Cathartus* Reiche, but Winkler (Cat. Col. palaearct. **6**, 1926, 709, 710) gives them as separate genera, and *Ahasverus* as the generic name for *advena* Waltl.—HORACE DONISTHORPE, British Museum, Nat. Hist. (Department of Entomology): *September 14th*, 1936.

A note on Langelandia anophthalma Aubé.—Mr. J. H. Stephens (*antea*, p. 180), when recording this beetle from Chatham, suggests that there has been no further notice of its occurrence since the first capture by the Rev. T. Wood as recorded in Fowler (**3**, 1889, 193). As a matter of fact my friend Sir T. Hudson Beare and I each took our series in seed-potatoes at St. Peter's, Kent, on July 2nd, 1923 (Proc. R. Ent. Soc. Lond., 1923, lii).—H. DONISTHORPE.

Atheta (Hygroecia) magniceps Sahlb. in Oxfordshire.—On January 11th of this year I brought in a small quantity of flood-refuse from Wootton, near Woodstock (not to be confused with the Wootton in Berkshire, better known to Oxford collectors), and set aside four specimens found therein as *Atheta debilis* Er. I owe to Mr. H. Britten the identification of two of them as *A. magniceps* Sahlb., a species originally detected at Dalwhinnie, N.B., and only recorded, according to Joy, from one English county, Hertfordshire.—L. W. GRENSTED, 32 Charlbury Road, Oxford: *September 18th*, 1936.

A beetle in a bedstead.—Another of the not infrequent cases of longevity in Longicorn beetles imported into this country in foreign timber has just been brought to my notice. Mrs. Lethbridge, of Hampstead, has heard for about five years what she describes as a ticking sound proceeding from a wooden bedstead. Lately a hole appeared in the rail at the foot of the bed and the head of a beetle was seen emerging. The specimen was brought to me for identification and proved to be an example of the North American Cerambycid, *Eburia quadrigeminata* Say. The sound heard was evidently caused by the insect in its larval state gnawing the wood, in which it no doubt existed previous to its importation from America. How much more than five years ago this may have been I cannot say.—GILBERT J. ARROW, British Museum (Natural History), London, S.W.7: *September 15th*, 1936.

[The wood from which the beetle emerged was stated to be probably oak. In February, 1933, the British Museum received from a furniture-dealer a specimen of the same species, from a sideboard said to be made of oak. Blatchley, however, gives (Coleoptera of Indiana, p. 1022, 1910) ' hickory, ash and honey locust ' as trees in which *Eburia quadrigeminata* breeds. It may be recalled that this Magazine for 1923 (Vol. LIX, p. 90) contained a note on a Cerambycine larva which had been in a walnut-wood chair for at least twenty years, and in the same note reference was made to several older records of longevity in insects of this family.—EDS.]

A Note on Wireworm injury to fruit-trees.—In July, 1936, the writer visited a large field of Maiden Cordon apples at the request of the owner, who said that wireworms were damaging the trees. Examination of the trees by removing the soil at the base of the stem revealed the presence of a number of wireworms feeding on the bark and the wood of the stem. In some cases the whole of the bark had been eaten away all round the stem for a distance of one inch or more below the surface of the soil. It was interesting to note that the damage was worse where the trees had been planted too deeply, so that the stock was buried completely and the base of the scion was in the soil. Where the stock was planted properly the damage was much less extensive, showing that the wireworms preferred to feed on the scion rather than on the stock. A count was made on 20 trees down a row; this gave a variation of from 2 to 27 wireworms per tree, with an average of about 9. Nearly every tree examined anywhere in the field had at least two wireworms feeding on it. Examination of the roots showed that they were damaged very little, if at all.

The field had been planted in the Autumn of 1935. Previous to that it had been down to pasture for at least thirty years. It was ploughed up in the Spring of 1935, but owing to the dry Summer the clods of soil and turf were not broken down too well, and it was not cultivated a great deal before the fruit-trees were planted. After planting it was worked fairly frequently and the weeds kept down, so that when visited there were no weeds at all present on which the wireworms could feed; as a result they were attacking the fruit-trees.—G. L. HEY, One Tree House, Church Road, Leyland, Lancs. *August 9th*, 1936.

Note on a collection of Tortrix larvae.—On May 14th, 1936, the writer made a collection of Tortrix larvae on apple in an extensive orchard at Burwell Fen, Cambs. Altogether 50 larvae and 6 pupae were collected, and from these 38 moths and 7 parasites were bred out. These comprised four ♂ and two ♀ *Cacoecia podana* Scop., one *Argyroploce variegana* Hübn., five *Cacoecia lecheana* L., seven *Spilonota ocellana* Fabr. and nineteen *Pandemis ribeana* Hübn.

The moths were identified by Mr. H. Stringer of the British Museum, Natural History, to whom the writer wishes to take this opportunity of recording his grateful thanks. The parasites have not yet been identified. It is of interest to note that, although the writer was well acquainted with the larvae of *C. podana*, he found great difficulty in separating them from those of *P. ribeana*, and in some cases was unable to do so by casual examination by naked eye or hand-lens. The larvae of *A. variegana* are easily recognised by their prominent dark spots and dark or dark-spotted anal plate, and those of *C. lecheana* by the prominent yellow area on the anterior margin of the dorsum of the second thoracic segment, and by the pale yellow ventral surface contrasting with the very dark dorsal surface of the thorax and abdomen.

It is of interest here to record the value for trapping Tortrices of the bait-pans, such as are used for determining the flight period of the Codlin Moth. Through the courtesy of Dr. I. Thomas of the School of Agriculture, Cambridge, the writer on June 11th, 1936, examined several of these pans containing fermenting molasses, and found over a dozen moths of *Cacoecia lecheana* L. and several of *C. podana* Scop. Dr. Thomas also informs me that during late June and July he has taken a fair number of moths of several other species as well, including those of *Batodes angustiorana* Haw. and *Argyroploce variegana* Hübn. To anyone working on the Tortricidae the use of bait-pans offers a very simple method of determining the flight-period of the moths; the only real difficulty would be in identifying them if they have got their wings covered by the fluid.—G. L. HEY: *August 9th*, 1936.

Nothochrysa capitata Fabr. in Midlothian.—As far as I know, there has been no previous record of the occurrence of this fine Chrysopid in Scotland. It is therefore pleasing to report that I had the good fortune to meet with an example of the species when collecting in the Roslin Glen on 28th July, under weather conditions which were far from favourable. The early morning had looked not unpromising, but by the time I reached the wood shortly after eleven a drizzling rain had set in and it continued till about one o'clock. When the insect was found, the foliage was still dripping and the net had to be wrung out constantly. I was amazed when I discovered it wallowing amongst wet leaves at the bottom of the soaked net and realised that it was *N. capitata*. It was beaten from an oak; two smallish conifers were nearby—a spruce and a pine. It is a female and in perfect condition. My late friend Porritt reported the species as not infrequent and widely distributed in Yorkshire; at present I am unable to say whether it has been recorded from any of the English counties further north. The other species, *N. fulviceps*, has been recorded from Durham. I may add that the only other Chrysopids found on 28th July were a pair of *Chrysopa flava* and a female of *C. ciliata*.

McLachlan (E.M.M., XXXI, p. 121, 1895) mentioned a peculiarity in certain females of *N. capitata,* on or about the ante-penultimate segment of the abdomen and apparently always on the left side, in the shape of a more or less rounded whitish mass, appearing more like something attached externally than an exudation, sometimes nearly smooth but usually made up of coarse agglutinated granules. In an example of *N. fulviceps* he found the mass present on both sides of the abdomen. In my specimen the mass is very conspicuous and consists of granules; its position is dorsal and there is just a very vague suggestion of median longitudinal subdivision.—KENNETH J. MORTON, 13 Blackford Road, Edinburgh: *24th September,* 1936

THE ETHIOPIAN SPECIES OF THE *FASCIATA* GROUP OF THE GENUS *BACTRIA* (= *PROMACHUS*) (DIPTERA, ASILIDAE).

BY B. M. HOBBY, M.A., D.PHIL., F.R.E.S., M.S.B.E.
Fellow of The Queen's College, Oxford.
From the Hope Department of Zoology (Entomology), Oxford University Museum.

(*Continued from p.* 199.)

7. *Bactria gossypiata* Speiser.

1910. *Promachus gossypiatus* Speiser, Kilimandjaro Meru Exp., **10** (4): 97-8.

1920. *Promachus gossypiatus* Ricardo, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 179.

A dark species superficially resembling *B. fasciata,* but more closely allied to *B. aequalis* in the structure of the genitalia.

♂ ♀. Length of body 16-21 mm., of wing 12-17 mm.

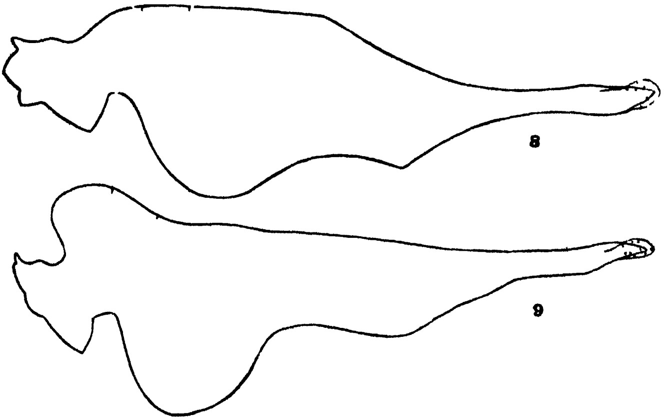
♂. *Head.* Mystax chiefly yellow, outer and upper bristles usually black, lateralia mainly with yellow hairs. Greatest width of eye about one-and-three-quarters the width of face at narrowest point.

Thorax. Mesonotum black without distinct stripes, at the sides with dark brownish pruinescence. Scutellum with black bristles; most of the hairs usually black, although a few, and very rarely nearly all, may be yellow.

Legs. Length of posterior femora about four times the dorso-ventral diameter. Yellow hairs not so abundant as in *B. aequalis.* The posterior femora with the basal group of spines situate on a distinct swelling as in *B. aequalis;* the ventral row consisting of three to eight spines, some of which may be present in duplicate; the oblique row either absent or represented, at the most, by one or two spines. Posterior tibiae distinctly curved as in *B. fasciata,* but the ventro-distal pad of spines even less distinct than in that species.

Wings. Almost as dark as those of *P. fasciata;* costa with a few yellow bristles at extreme base.

Abdomen. The first tergite usually with the hairs yellowish, less frequently with the hairs whitish or black, at the sides almost always with some of the hairs black. The fourth, fifth, sixth and seventh tergites with dark brownish-grey pruinescence at the sides; the long hair-like bristles at the sides usually black, but sometimes a few are yellow. Eighth tergite with the bristles black. Sternites with long black and long yellow hairs; the eighth sternite somewhat truncate, the long bristles black. Upper forceps (ninth tergite) short like those of *B. aequalis*, bristles black. Ninth sternite as in *B. aequalis*, but style of coxite with a much enlarged basal lobe. Aedeagus of the same type as that of *B. aequalis*, but the distal part with a strong dorsal lobe projecting posteriorly and the basal part with a very strong ventral lobe (Figs. 9 and 33).



FIGS. 8 and 9.—Aedeagus, lateral view. 8, *aequalis* Loew; 9, *gossypiata* Speiser.

♀. Closely resembles the male. Distinguished from the females of *B. aequalis* by the dark brown thoracic pruinescence and the stouter ovipositor.

Specimens seen: TANGANYIKA: — 1 ♂ paratype, Usambara, Mombo, vi. (Y. Sjöstedt, Stockholm Mus.). NYASALAND:—18 ♂♂, 12 ♀♀, Mt. Mlanje, 5.xii.1912—17.iii.1913 and 25.ii.1914 (*S. A. Neave*, Brit. Mus.). AFRICA:—1 ♂ from an old collection (Vienna Mus.).

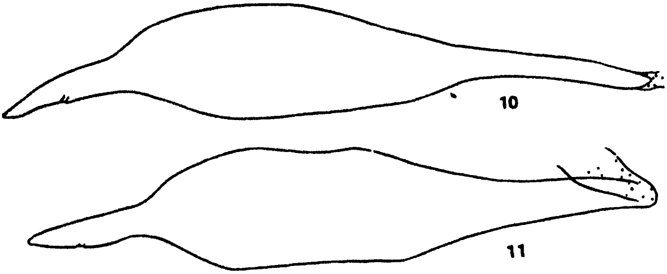
8. **Bactria acuminata** sp.nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, 5: 171.

♂. Indistinguishable from *B. aequalis* except by the form of the aedeagus which is acuminate, broadest about the middle, and without dorsal or ventral lobes (Figs. 10 and 35).

Holotype :—♂, NYASALAND, Mt. Mlanje, 15.iii.1913 (*S. A. Neave*, Brit. Mus.). *Paratypes* : NYASALAND:—4 ♂♂, Mt. Mlanje, 5.ii.1913, 6.ii.1913, 17.ii.1913 and 20.iii.1913 (*S. A. Neave*, Brit. Mus.). TANGANYIKA: — 1 ♂ without further data (*Potts*, Hope Dept.).

Note.—The aedeagus of this species (and of *B. conradti*) is of a type rather different from that of the remaining species of the *fasciata* group. Mr. J. E. Collin (in conversation, and with only my drawings before him) suggested the possibility that the specimens on which these two species were based might be intersexual forms. Acting upon his suggestion I searched for the actual opening of the male genital duct as this is often closed in intersexual individuals. The specimens examined showed this duct leading to the exterior quite clearly and all had the remaining terminal abdominal structures of the usual male type. On these grounds, therefore, I prefer for the time being to consider *B. acuminata* and *B. conradti* as distinct species, but I must confess that I am a little puzzled by the morphology of the aedeagus and eagerly await the discovery of more material.



FIGS. 10 and 11.—Aedeagus, lateral view. 10, *acuminata* sp. nov.; 11, *conradti* sp. nov.

9. **Bactria conradti** sp. nov.

Resembles *B. acuminata* in the form of the aedeagus, but is distinguished by the following characters :—

♂ ♀. Length of body 20-21 mm., of wing 14-15 mm.

♂. *Head*. Mystax, lateralia, palps, occiput and frons with bristles and hairs yellow. Ocellary tubercle posteriorly with both black and yellow hairs. The basal antennal segment with nearly all the hairs yellow. Beard whitish-yellow.

Thorax. Pronotum with yellow hairs and bristles. The whole mesonotum with dense brown pruinescence covering the black stripes; bristles and hairs black except for several bristles which are yellow, and yellow hairs anteriorly, posteriorly, above the wing bases and on the post-alar calli. Scutellum with all the hairs and many of the bristles yellow.

Legs. Black except the anterior tibiae, which have the posterior surface obscurely reddish-brown, and the middle tibiae, which have the dorsal, posterodorsal and posterior surfaces largely reddish-brown.

Abdomen. Dorsal surface black with a band of yellowish-brown pruinescence at the sides; the first three segments with bands of white hairs dorsally and yellow hairs and bristles at the sides; the fourth and succeeding segments with the bristles yellow. Ventral surface with yellow bristles and hairs and yellowish-brown pruinescence. Upper forceps (ninth tergite) short as in *B. acuminata,* but the distal extremities slightly turned *inwards;* the hairs and bristles black and yellow intermixed. Aedeagus similar to that of *B. acuminata,* but stouter (Figs. 11 and 36).

♀. Resembles the male.

Holotype, ♂, and *allotype,* ♀, NIGERIA, Johann-Albrechtshöhe (*L. Conradt,* Berlin Mus.).

Note.—See discussion under *B. acuminata* (p. 233).

10. **Bactria neavei** sp. nov.

1920. *Promachus xanthotrichus* Ricardo (*partim*), *nec* Bezzi, *Ann. Mag. Nat. Hist.,* Ser. 9, **5**: 180.

Superficially resembles the yellow-bristled forms of *B. aequalis* from which it is distinguished by the yellow occipital bristles.

♂ ♀. Length of body 20-27 mm., of wing 14-21 mm.

♂. *Head.* Mystax, lateralia, palps and occiput with bristles and hairs yellow. Ocellary tubercle with the hairs black, elsewhere the frons usually with the hairs black although sometimes a few of the hairs yellow. Basal antennal segment with nearly all the bristles black, a few of them yellow.

Thorax. Pronotum with yellow hairs and bristles. Mesonotum with a broad medio-dorsal blackish-brown stripe and on each side with a broad laterodorsal blackish stripe transversely subdivided into two large spots; pruinescence at sides and between the spots yellowish-brown; bristles usually black; anteriorly, posteriorly and above the wing-bases the hairs yellow, elsewhere the hairs black. Scutellum usually with the bristles and hairs yellow, sometimes a few of them black.

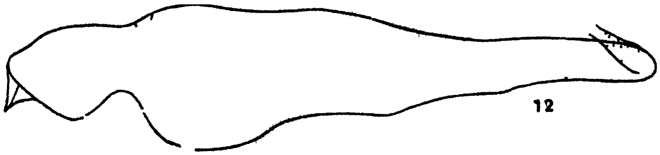


FIG. 12.—*neavei* sp. nov.; aedeagus, lateral view.

Legs. Black except the posterior and dorsal surfaces of the tibiae, which may be more or less distinctly dull brownish; nearly all the bristles and spines black, sometimes a few of them yellow. Posterior femora about four times as long as the dorsal-ventral diameter, with an oblique row of about four rather widely separated long spines extending distally from the ventral group towards the posterior surface, and with a ventral row consisting of about nine rather shorter spines, some of which may be present in duplicate. Posterior tibiae gently arched, a little longer than the posterior tarsal segments together; slightly swollen distally where there is a ventral pad of very short spines, of which the terminal one is rather longer and forms a *small* tooth-like claw.

Wings. Resembling those of *B. aequalis.*

Abdomen. Black, the first seven tergites with a broad band of yellowish-brown pruinescence at the sides; the first segment either with all the hairs yellow or with some yellow, others white, the bristles at the sides yellow; second and third segments with tufts of white hairs and at the sides with a few yellow hairs; the four succeeding segments with the bristles on the disc black, those at the sides yellow. Ventral surface black, the first seven sternites with yellowish-brown pruinescence and yellow bristles and hairs, eighth sternite convex, not truncate, the bristles long, sometimes all black, sometimes black and yellow intermixed. Upper forceps (ninth tergite) short and scarcely extending beyond the anal (tenth) segment; about twice as long as broad and rather more ovate than those of *B. aequalis;* with a *small* extension on the posterior margin, near the base of the anal (tenth) segment. Aedeagus with a pair of small downwardly directed triangular processes at the distal extremity (Figs. 12 and 37). Ninth sternite almost entire.

♀. Closely resembles the male.

Holotype, ♂, and *allotype,* ♀, in *copula,* NYASALAND, Mt. Mlanje, 2.i.1913 (*S. A. Neave,* Brit. Mus.). *Paratypes* : NYASALAND: — ♂ and ♀ in *copula,* 21.xi.1912 and 13.xii.1912 (*S. A. Neave*); 46 ♂♂, 83 ♀♀, x.1912—ii.1913 (*S. A. Neave*); 2 ♀♀, ix.1913 — ii.1914 (*J. B. Davey*). All the above from Mt. Mlanje (Brit. Mus.). TANGANYIKA :—1 ♂, Tanga (*Neumann,* Berlin Mus.).

11. **Bactria mixta** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.,* Ser. 9, 5: 171.

Superficially resembles *B. neavei* from which it differs in the following characters :—

♂. Length of body 21-23 mm., of wing 16-17 mm.

♂. *Head.* Mystax usually with some of the outer and upper bristles black, lateralia with some or all of the bristles black. Palps with both black and yellow bristles. Frons with all the hairs black.

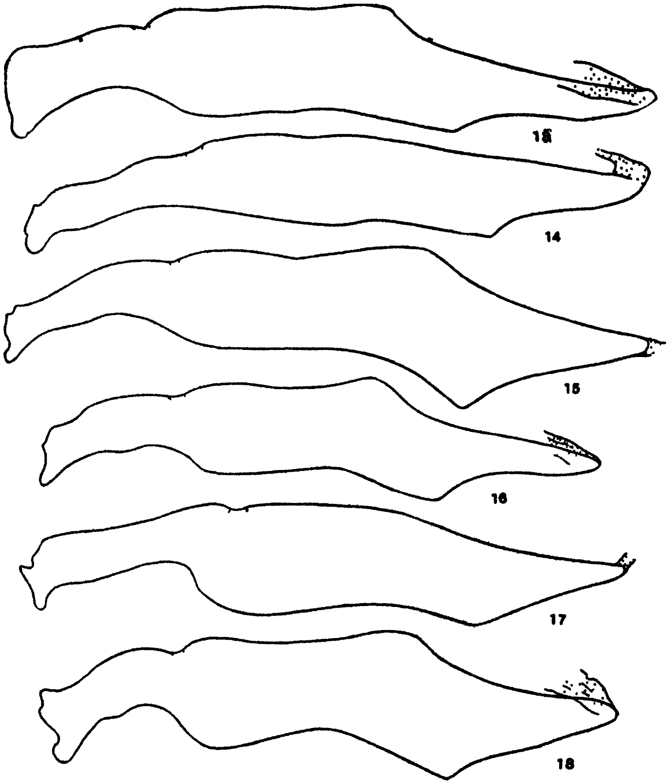
Thorax. Pronotum with the bristles black. Mesonotum with pruinescence darker, stripes less distinct and yellow hairs less numerous.

Legs. Anterior femora without or with one or two posterior bristles. The four posterior femora with a few of the bristles yellow. Posterior femora with some of the spines in the basal group yellow, the remaining spines black; ventral row composed entirely or chiefly of yellow spines; oblique row extending towards posterior surface composed of black spines, but partially duplicated by yellow spines. Posterior tibiae less distinctly curved.

Abdomen. The fourth to seventh tergites sometimes with a few yellow bristles on the disc and along the hind margins of the segments. Eighth sternite with short black bristles. Upper forceps (ninth tergite) extending beyond anal (tenth) segment, about three times as long as broad. Ninth sternite with a weakly chitinised median area in the distal margin. Aedeagus without dorsal or ventral lobes, distal part as viewed from above somewhat funnel shaped (Figs. 13 and 38).

♀. Two specimens which I place provisionally as females of this species closely resemble the males, but have the uppermost occipital bristles black and yellow hairs on the second and third abdominal segments.

Holotype :—♂, Uganda, Tero, 14.iv.1911 (*C. C. Gowdey*, Brit. Mus.). *Paratypes* : Uganda :—1 ♂, Tero, 14.iv.1911 ; 1 ♂, Tero Forest, 5.vii.1912 (*C. C. Gowdey*, Brit. Mus.). 2 ♂♂, between Mitiana and Entebbe, 3800 feet, 9-11.i.1912 (*S. A. Neave*, Brit. Mus.). Tanganyika:—1 ♂, 'Urw.-Mawambi,' 1910 ; 1 ♂, 'Urwald-Beni', x.1910 (*Grauer*, Vienna Mus.). *Females* (*not to be considered as paratypes*) : 2 ♀♀ (Brit. Mus.), mounted in the same way, but without locality label. One of them bears a museum label 'Pres. by the Imp. Bur. Ent., 1921-12', as also do the two males taken by S. A. Neave in Uganda.



Figs. 13—18.—Aedeagus, lateral view. 13, *mixta* sp. nov. ; 14, *entebbensis* sp. nov. ; 15, *crassifemorata* sp. nov. ; 16, *carpenteri* sp. nov. ; 17, *venatrix* sp. nov. ; 18, *promiscua* sp. nov.

12. **Bactria entebbensis** sp.nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, 5: 171.

A dark species superficially resembling *B. fasciata,* but larger and with the anterior four tibiae partially of a dull brownish colour. Differs also in the following characters :—

♂. Length of body 22-4 mm., of wing 17-18 mm.

♂. *Head.* Lateralia with all the hairs and bristles yellow. Greatest width of eye about one-and-three-quarter times the width of face at narrowest point. Palps with black and yellow bristles intermixed.

Legs. Anterior femora with one or two bristles on the posterior surface; length of posterior femora about four times the dorso-ventral diameter. Posterior femora with a postero-ventral group of about twenty stout spines near base and with a row of about four spines extending towards the posterior surface; ventral row of spines not present. Posterior tibiae with a distal pad of spines of which the terminal spine is longer and forms a small, but distinct, tooth-like claw. The four anterior tibiae with the posterior and adjacent surfaces yellowish-brown.

Abdomen. The first tergite with a band of white hairs, the fourth and succeeding tergites with nearly all the bristles black. The first three sternites with long yellow hairs, the three following sternites with short yellow bristles and the seventh with most of the bristles short and black. The eighth sternite densely clothed with short black bristles, strongly convex and with the distal margin almost semi-circular. Upper forceps (ninth tergite) about three times as long as greatest breadth and with the tips not curved inwards; each limb with a *small* extension on the posterior margin near the base of the anal (tenth) segment. Ninth sternite entire, about one-and-three-quarter times as broad as long. Aedeagus without dorsal or ventral lobes, slightly expanded shortly before the apex (Figs. 14 and 39).

♀. Specimens which I place provisionally as females of this species resemble the males, but have the tibiae and mystax darker.

Holotype, ♂, UGANDA, Entebbe, about 3800 feet, from grazing land on lake shore, 31.v.1909 (*C. A. Wiggins,* Hope Dept.). *Paratypes*: UGANDA: — 1 ♂, Entebbe, from forest, lake shore, east of Kitabi Hill, 22.vi.1912 (*C. A. Wiggins,* Hope Dept.); 1 ♂, Entebbe, 14.xi.1912 (*C. C. Gowdey,* Brit. Mus.). *Females* (*not to be considered as paratypes*): UGANDA : — 2 ♀ ♀, Entebbe, 3.ix.1912 and 16.x.1912; 1 ♀, Tero, 14.iv.1911 (*C. C. Gowdey,* Brit. Mus.).

13. **Bactria crassifemorata** sp. nov.

Allied to *B. entebbensis,* from which it is distinguished by the following characters :—

♂. Length of body 24 mm., of wing 17 mm.

♂. *Legs.* Anterior femora without bristles on postero-dorsal surface. Length of posterior femora nearly three-and-a-half times the dorso-ventral diameter. Posterior femora with the basal group and oblique rows composed of rather long and stout spines, the oblique row consisting of about five spines partially present in duplicate; the ventral row composed of weaker spines, some of which are present in duplicate and all of which, except a few near the base, are yellow.

Abdomen. The first tergite with yellow and white hairs intermixed, at the sides with some of the hairs black. The second and third tergites at the sides with the hairs yellow; the fourth tergite at the sides with yellow bristles; the remaining tergites with the bristles black. Eighth sternite somewhat truncate. Aedeagus with distal part sub-cylindrical as viewed from above (Figs. 15 and 40).

Holotype: — ♂, CAMEROONS, Duala, 22.x. (*v. Rothkirch*, Deutsch. Inst.).

14. **Bactria carpenteri** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 171.

Closely related to *B. crassifemorata* from which it differs in the following characters: —

♂. Length of body 19-22 mm., of wing 15-17 mm.

♂. *Head.* Mystax above and at the sides with the bristles black, lateralia with most of the bristles and hairs black.

Legs. Posterior femora less stout, posterior tibiae more strongly curved. Posterior femora with the ventral row of spines either entirely black or with only the distal spines yellow.

Abdomen. Above, the first segment with a band of white hairs, at the sides usually with a few of the hairs yellow and others which are black; the second and third segments at the sides without, or with very few, yellow hairs. Upper forceps (ninth tergite) a little shorter and broader. Ninth sternite about twice as broad as long, the distal margin with a weakly chitinised median area. Aedeagus with the distal part shorter and stouter (Figs. 16 and 41).

♀. Specimens which I place provisionally as females of this species closely resemble the males, but tend to have yellow hairs on the second and third abdominal segments.

Holotype: — ♂, UGANDA, L. Victoria, Sese Islands, Bugalla Island, in forest by lake shore where *Glossina palpalis* abounds, iii.1912 (*G. D. H. Carpenter*, Brit. Mus.). *Paratypes*: UGANDA: — 1 ♂, Tero, 14.iv.1911; 1 ♂, Kampala, 13.vii.1911; 2 ♂♂, Entebbe, 3.ix.1912 (*C. C. Gowdey*, Brit. Mus.). 1 ♂, Entebbe, 1-11.ix.1911 (*S. A. Neave*, Brit. Mus.). 2 ♂♂, Bugalla Island, iii.1912 (*G. D. H. Carpenter*, Brit. Mus.). 1 ♂, 17.vi.1912; 1 ♂, 19.vi.1912; 1 ♂, 20.vi.1912; 2 ♂♂, 24.vi.1912; Entebbe, all about 3800 ft. in forest N.E. of Kitabi Hill (*C. A. Wiggins*, Hope Dept.). 1 ♂, Entebbe, 1-14.ix.1912 (*C. A. Wiggins*, Brit. Mus.). TANGANYIKA: — 1 ♂, 'Urwald Beni,' ix.1910 (*Grauer*, Vienna Mus.). 1 ♂, Mawembi-Ukaika, xi-xii.1910 (*Grauer*, Vienna Mus.). *Females (not to be considered as paratypes)*: UGANDA: — 1 ♀, iii.1912; 2 ♀♀, viii.1912 (*G. D. H. Carpenter*, Brit. Mus.).

15. **Bactria venatrix** sp. nov.

Superficially not unlike *B. aequalis* Loew, but closely related to *B. carpenteri* from which it differs in the following characters :—

♂ ♀. Length of body 18-20 mm., of wing 14-15 mm.

♂. *Head.* Mystax, lateralia and palps with hairs and bristles yellow. Most of the occipital bristles yellow, a few of the bristles black.

Thorax. Mesonotum with pruinescence yellowish-brown and traces of a striped pattern. Scutellum with black hairs and both yellow and black bristles.

Legs. Black except the tibiae, which may be more or less extensively dull reddish-brown. Posterior femora stouter and with simple ventral and oblique rows of well developed spines. Posterior tibiae not so strongly curved.

Wings. Veins reddish-brown, costa with yellow bristles at the base.

Abdomen. Tergites with pruinescence at the sides yellowish; first segment with the hairs white except at the sides, where they are yellow; fourth and fifth segments at the sides with a few yellow bristles, the remaining bristles black. The first six sternites with yellow pruinescence and long yellow hairs; the seventh sternite with black bristles distally. Aedeagus with distal part longer; basal part with ventral lobe weakly represented (Fig. 17).

♀. Resembles the male.

Holotype : — ♂, Kenya, Nairobi, 1915 (*A. Loveridge,* Brit. Mus.). *Allotype,* ♀, and *paratype,* ♂ : Kenya, Nairobi, Ngong, 29.x.1919 (*A. Loveridge,* Brit. Mus.).

16. **Bactria promiscua** sp. nov.

Resembles *B. mixta* from which it differs in the following characters :—

♂. Length of body 8 mm., of wing 16 mm.

♂. *Head.* Palps with nearly all the bristles above and the distal bristles below black, the basi-ventral bristles yellow. Occiput with black and yellow bristles intermixed.

Thorax. Mesonotum with all the hairs black except for a few on the post-alar calli, which are yellow. Scutellum with a few black hairs intermixed with the yellow bristles and hairs.

Legs. Anterior femora with two posterior bristles. Posterior femora with the basal group and the oblique rows of spines black, the ventral row of spines yellow. Posterior femora much thicker, length about three-and-two-thirds the dorso-ventral diameter. Posterior tibiae strongly curved.

Abdomen. Fourth tergite on the disc with both white and yellow bristles. Aedeagus not unlike that of *B. mixta,* but with distal part distinctly sinuate as viewed from the side, and pear-shaped as viewed from above (Figs. 18 and 42).

Holotype :—♂, Belgian Congo, Komi, Sankuru, 8.iv.1930 (*J. Ghesquière,* Mus. Congo).

17. **Bactria wollastoni** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.,* Ser. 9, 5: 171.

Superficially resembles *B. aequalis* from which it differs in the following characters :—

♂ ♀. Length of body 17-20 mm., of wing 13-22 mm.

♂. *Thorax.* Mesonotum with stripes less distinct. Scutellum with the hairs yellow, the bristles black and yellow intermixed or all yellow.

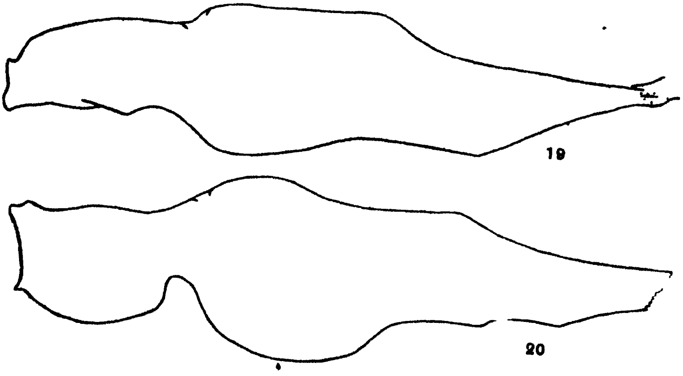
Legs. Posterior femora with an oblique row of about four spines extending distally from the postero-ventral group of spines towards the posterior surface.

Wings. Costa with all or nearly all the bristles black.

Abdomen. First segment with a narrow band of hairs which are white on the disc and yellow at the sides. Eighth sternite more rounded. Upper forceps (ninth tergite) stouter, each limb with a *small* extension on the posterior margin near the base of the anal (tenth) segment. Anal segment more elongate. Aedeagus almost parallel-sided in lateral view, distal part on each side with a very small triangular process basi-ventrally (Fig. 19).

♀. Closely resembles the male.

Holotype, ♂, and *allotype*, ♀, UGANDA, E. Ruwenzori, 5,000-7,000 ft., 2.i.1906 and 26.i.1906 (*G. Legge* and *A. F. R. Wollaston*, Brit. Mus.). *Paratypes*: KENYA:—1 ♂, v.1913; 1 ♀, 1912; both Mogorr River (*A. O. Luckman*, Brit. Mus.).



FIGS. 19 and 20.—Aedeagus, lateral view. 19, *wollastoni* sp. nov.; 20, *cornuta* sp. nov.

18. **Bactria cornuta** sp. nov.

Allied to *B. wollastoni* from which it differs in the following characters:—

♂. Length of body 20 mm., of wing 17 mm.

♂. *Thorax.* Without distinct stripes. Scutellum with all the bristles and hairs yellow.

Legs. Posterior femora stouter, posterior tibiae more strongly curved.

Abdomen. First segment with a band of yellow hairs. The fourth and following segments with the yellow bristles at the sides more numerous. Upper forceps (ninth tergite) more elongate, but only extending as far as the anal (tenth tergite) segment. Aedeagus not parallel-sided, basal part with ventral lobe, distal part very broad dorso-ventrally (Fig. 20).

Holotype: ♂, without data, possibly from UGANDA (Brit. Mus.).

A very distinct species with reddish-brown femora and tibiae, and pitchy tarsi.

♂. Length of body 20-21 mm., of wing 14-15 mm.

♂. *Head.* Mystax, lateralia and beard with bristles and hairs yellow; all or nearly all the occipital bristles yellow. Palps above and distally with the bristles black, below with the bristles yellow. Frons with most of the hairs black. Basal antennal segments with both black and yellow bristles. Greatest width of eye about one-and-four-fifths times the width of face at narrowest point. Facial hump not quite as well developed as that of *B. aequalis*.

Thorax. Pronotum with yellow hairs and a row of yellow bristles. Mesonotum similar to that of *B. aequalis*. Scutellum with hairs and bristles black.

Legs. Coxae black; trochanters warm reddish-brown narrowly bordered with black; femora chiefly warm reddish-brown, the knees partly black, the anterior surfaces of the anterior femora sometimes partly blackish; tibiae warm reddish-brown; tarsi pitchy; claws black except at the base, where they are reddish-brown. Anterior femora with or without a postero-dorsal bristle. Length of posterior femora about four times the dorso-ventral diameter, about one-and-a-third times as long as the posterior tibiae. Basal third of posterior femora with a slight general postero-ventral swelling bearing a group of spines of which those nearer the anterior surface are long. Ventral surface with a row of about seven short spines, a second row of about six longer spines running almost parallel with first, but slightly diverging distally towards the postero-ventral surface, and a more posterior third row of about four long spines. Posterior tibiae distinctly curved, slightly shorter than the posterior tarsal segments together; disto-ventral pad of spines hidden beneath the hairs, the terminal spine stouter and forming a *short* tooth-like claw.

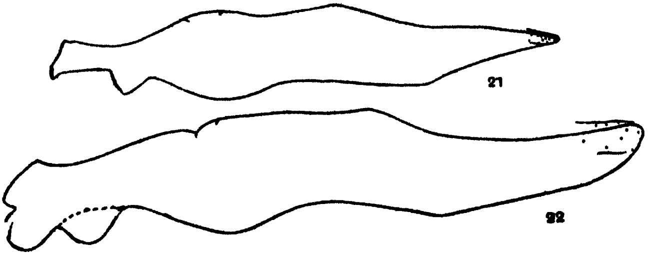
Wings. Very similar to those of *B. aequalis.*

Abdomen. Black above; the first seven tergites at the sides with a broad band of yellowish-grey pruinescence which tends to extend inwards along the hind margins of the segments; the first three segments with bands of white hairs; the four following segments with short yellow bristles at the sides and black ones on the disc; the remaining segments shining black with black bristles. Ventral surface black; the first seven segments with yellowish-grey pruinescence, the hairs white, yellow or black. The eighth sternite truncate, shining black with black bristles. Upper forceps (ninth tergite) extending beyond anal (tenth) segment about two-and-a-half times as long as broad, the tips not bent inwards. Ninth sternite with a weakly chitinised median area in the distal margin. The distal part of the aedeagus with a small latero-ventral equilateral triangular process on each side (Figs. 21 and 43).

♀. A specimen which I place provisionally as the female of this species closely resembles the male, but differs in having some of the pronotal bristles black, the scutellar bristles yellow, the scutellar hairs white and the tarsi black.

Holotype, ♂, and *paratype*, ♂, BELGIAN CONGO, Haut Uelé, Yebo Moto (1926 and 1924 respectively) (*L. Burgeon*, Mus. Congo). *Female* (*not to be considered as a paratype*), UGANDA, Wakolis, about 30 miles north of Lake Victoria, 3,600 ft., among elephant grass, 4.iv.1906 (*C. A. Wiggins*, Hope Dept.).

Note.—A headless female from SIERRA LEONE, Firiwa, 9.vi.1912 (*J. J. Simpson*, Brit. Mus.) closely resembles *B. erythrosceles*, but I believe it to be distinct. A small male from SIERRA LEONE (*D. F. Morgan*, Brit. Mus.) also resembles *B. erythrosceles*, but differs in the arrangement of bristles on the posterior femora. Since the terminal abdominal segments are missing it is unwise to describe it as new, although it is probably distinct. It was erroneously referred to *B. fasciata* by Ricardo (1920, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 172).



FIGS. 21 and 22.—Aedeagus, lateral view. 21, *erythrosceles* sp. nov.; 22, *rufotibialis* sp. nov.

20. **Bactria rufotibialis** sp. nov.

Resembles *B. erythrosceles* in having reddish-brown tibiae, but differs from this species in having the femora black and in the following characters :—

♂. Length of body 19 mm., of wing 13 mm.

♂. *Head.* Palps with all the hairs yellow.

Thorax. Mesonotum with nearly all the hairs black.

Legs. Trochanters chiefly black; femora with only a trace of reddish-brown distally, tarsi blackish. Anterior femora without postero-dorsal bristles. Posterior femora with a basal group of spines, a ventral row of about four short spines and an oblique row of about five longer spines. Posterior tibiae scarcely curved, a little longer than the posterior tarsal segments together, the distal *third* covered with a ventral pad of spines.

Abdomen. Pruinescence at the sides and, less distinctly, along the hind margins of the tergites grey. Bristles at the sides of the fourth to seventh tergites white; the first seven sternites with white hairs. Aedeagus expanded at the tip, on each side with a broad but thin and rather transparent flange distally, without dorsal or ventral lobes (Figs. 22 and 44).

Holotype : ♂, AFRICA, from an old collection (Vienna Mus.).

Note.—A female from ABYSSINIA, xi.1911 (*R. J. Stordy*, Brit. Mus.) superficially resembles *B. rufotibialis*, but I believe it to be distinct.

21. **Bactria versicolor** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 171.

Resembles *B. erythrosceles*, but differs in having the femora partly or entirely black and in the following characters:—

♂ ♀. Length of body 18-21 mm., of wing 12-17 mm.

♂. *Head.* Anteriorly the frons usually with yellow hairs, posteriorly with black hairs. Palps with yellow bristles.

Thorax. Scutellum with most or all the bristles black, often a few of the bristles yellowish, hairs white.

Legs. In the holotype the trochanters and extreme base of femora brownish; the basal two-thirds of the femora chiefly black, the distal third testaceous except the knees which are partially black; tibiae testaceous; tarsi darker. In other specimens the testaceous colour is less extensive and the trochanters and femora may be entirely black. Femora and tibiae with nearly all the hairs yellow except on the anterior femora where nearly all the hairs are black. Anterior femora without postero-dorsal bristles. Length of posterior femora about four-and-a-half times its dorso-ventral diameter. Posterior femora with a sparse group of long spines near the base, a row of long spines on the ventral surface and a similar row extending towards the posterior surface; sometimes the spines, especially the ventral row, much reduced in number. Posterior tibiae not as distinctly curved as those of *B. erythrosceles*, slightly longer than the posterior tarsal segments together.

Abdomen. Very similar to that of *B. erythrosceles*, but pruinescence at the sides more yellowish, and the bristles at the hind margins of the segments on the eighth sternite sometimes yellow, the first seven sternites with all the hairs and bristles yellow. Ninth sternite entire. Aedeagus with the apex subtriangular as viewed from above; basal part with a strong ventro-distal lobe (Figs. 13 and 46).

♀. The allotype female closely resembles the holotype. A second female differs in having the abdominal pruinescence grey and the femora less broadly brownish distally.

Holotype:—♂, N.E. RHODESIA, mouth of the Chambezi to Mansya R. and L. Young, 4,500 ft., 31.x.-2.xi.1908 (*S. A. Neave*, Hope Dept.). *Allotype*:—♀, BELGIAN CONGO, S.E. Katanga, 4,000 ft., 24.xi.1907 (*S. A. Neave*, Brit. Mus.). *Paratypes*:—RHODESIA, 1 ♂, mouth of the Chambezi to Mansya R. and L. Young, 4,500 ft., 4.xi.1908 (*S. A. Neave*, Hope Dept.). BELGIAN CONGO:—2 ♂♂, Kapiri, x.1912, labelled 'Miss. Agric.' (Mus. Congo); 1 ♂, 1 ♀, Lomami, Kishinde, ix.1931 (*P. Quarre*, Mus. Congo). 1 ♀, Kinshassa, Waelbroeck (Brussels Mus.).

22. **Bactria hastata** sp. nov.

1920. ?*Promachus xanthotrichus* Ricardo (*partim*), *nec* Bezzi, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 180.

Allied to *B. versicolor* from which it differs in the following characters:—

♂ ♀. Length of body 17-21 mm., of wing 12-16 mm.

♂. *Head.* Frons with black hairs. Occiput with black bristles.

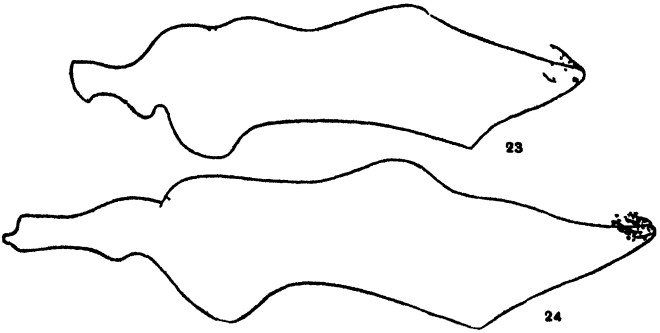
Thorax. Pronotum with black bristles. Scutellum usually with all the bristles and hairs black, occasionally some of them yellow.

Legs. Black. Posterior femora with the postero-ventral group of spines not situate so near the base, the spines rather long and more numerous. The ventral row consisting of about four to seven short spines, the oblique row consisting of about four rather long spines.

Wings. Cell R_5 narrowed and sometimes closed.

Abdomen. First tergite with the hairs usually yellowish; fourth, fifth, sixth, and seventh tergites with most of the bristles yellow. Eighth sternite produced, truncate apically where it bears a transverse row of long bristles. Aedeagus not unlike *B. versicolor,* but more elongate; the distal part, as viewed from above, broadest shortly before the middle; basal part with a very strongly developed ventral lobe (Figs. 24 and 47).

♀. Resembles the male.



FIGS. 23 and 24.—Aedeagus, lateral view. 23, *versicolor* sp. nov.; 24, *hastata* sp. nov.

Holotype:—♂, BELGIAN CONGO, Nyangwe, iv.-v.1918 (*R. Mayné,* Mus. Congo). *Allotype*:—♀, BELGIAN CONGO, Lomami, Kisamba (*P. Quarre,* Mus. Congo). *Paratypes*: BELGIAN CONGO:—1 ♂, with *Glossina palpalis* Desv., ♂, as prey, Lomami, 1931; 1 ♂, xii.1930, and 1 ♀, xii.1931, Lomami, Lusuku; 1 ♂, Lomami, Kisamba (all *P. Quarre,* Mus. Congo). 1 ♂, Sandoa, 24.xi.1918 (*F. G. Overlaet,* Mus. Congo). TANGANYIKA:—3 ♂♂, labelled 'Urw. hint d. Randbg. d. N.W. Tanganyika. S. 18-2200 m.'; 1 ♂, N.W. Tanganyika, 1910 (*Grauer,* Vienna Mus.).

Note.—In addition to the above I have seen the following four specimens which may belong to this species. (1) 1 ♀, PORTUGUESE CONGO, San Salvador, 1909 (*M. Gamble,* Brit. Mus.). Differs from type in having all the occipital and scutellar bristles yellow. Cell R_5 is closed. This is the specimen referred to *Promachus xanthotrichus* by Ricardo (1920). (2) 1 ♀, BELGIAN CONGO, Nyangwe, iv.-v.1918 (*R. Mayné,* Mus. Congo). This specimen has the three segments of the abdomen with yellow hairs. Scutellum and occiput with both yellow and black bristles. Cell R_5 is open. (3) 1 ♀, Belgian Congo, Lukugar, Niemba, xi.1917-i.1918 (*Dr. Pons,* Mus. Congo). Resembles the second of the above described specimens. (4) 1 ♀, Belgian Congo, Nyangwe, 29.xi.1910 (*Dr. J. Bequaert,* Mus. Congo). Resembles the second and third of the above described specimens, but has all the scutellar bristles yellow. Cell R_5 is just closed.

23. **Bactria calcarata** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.,* Ser. 9, **5**: 171.

A small species distinguished by the long spur on the posterior tibiae of the male and by the lateral wing-like processes of the aedeagus. (Described from a teneral specimen.)

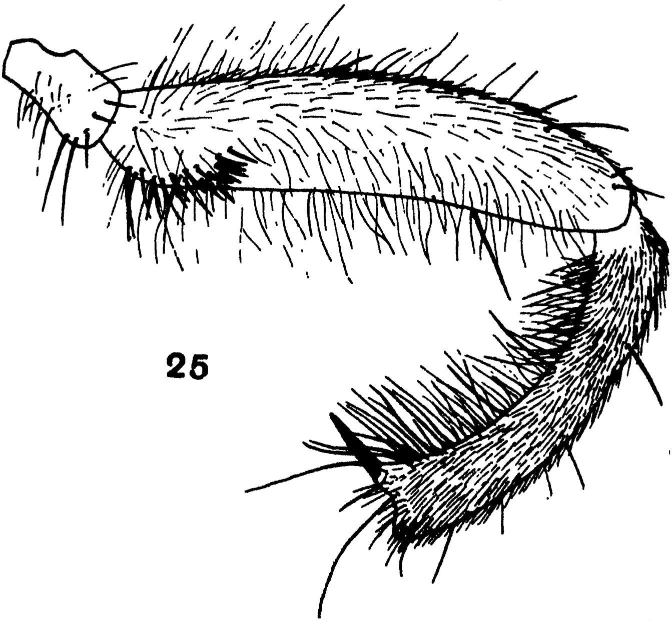


Fig. 25.—*calcarata* sp. nov.; trochanter, femora and tibia of posterior leg.

♂. Length of body 14 mm., of wing 11 mm.

♂. *Head.* Mystax mainly pale yellow, a few of the outer bristles black; lateralia with the hairs black. Greatest width of eye about 1.7 times the width of face at narrowest point. Basal antennal segments with both black and yellow hairs.

Thorax. Pronotum with only four fine black bristles. Mesonotum blackish, the sides more brownish; in front with a narrow median longitudinal reddish-brown stripe; pruinescence sparse and not distinct; humeral and post-alar calli with a few pale hairs. Scutellum brownish, some of the hairs and bristles black, others whitish-yellow.

Legs. Brownish-black. Length of posterior femora about four-and-three-quarter times the dorso-ventral diameter, about one-and-a-half times as long as the tibia. Posterior femora with a compact group of postero-ventral spines near the base, but without ventral or postero-ventral rows of similar spines. Posterior tibiae strongly curved, slightly shorter than the posterior tarsi together; distally with a long ventral spur (Fig. 25) instead of a pad of very short spines such as is found in *B. fasciata*.

Abdomen. Blackish; pruinescence below, and above at the sides, greyish; the first tergite with yelllowish-white hairs, the fourth and following segments with all the bristles black; the anterior sternites with long whitish hairs; the fourth, fifth, and sixth sternites with short yellow hairs, the remaining segments with black hairs and bristles. Upper forceps (ninth tergite) not extending beyond anal (tenth) segment, about twice as long as broad and inclined at an angle so as to form a roof-like cover to the terminal abdominal structures; each forcep with a *small* extension on the posterior margin near the base of the anal segment. Ninth sternite entire. Aedeagus with an elongate, isoscles, wing-like process, standing out at right angles to the longitudinal axis, near the base of the long narrow distal piece; the right and left halves of the distal piece slightly divergent and turned downwards at the extreme tip (Fig. 45).

Holotype : — ♂, ASHANTI, Obuasi, caught on leaf in bush, 10 a.m., 27.ix.1907 (*W. M. Graham,* Brit. Mus.).

24. **Bactria zenkeri** sp. nov.

A robust species superficially resembling *B. mediospinosa,* but having the spines on the hind femora of the male situate near the base as in *B. fasciata* from which it differs in the following characters : —

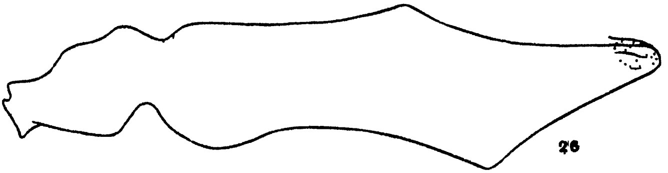


FIG. 26.—*zenkeri* sp. nov.; aedeagus, lateral view.

♂. Length of body 24 mm., of wing 17 mm.

♂. *Head.* Mystax yellow, outer bristles black; lateralia with black bristles and a few yellow hairs. Greatest width of eye about one-and-three-quarter times the width of face at narrowest point. Facial hump very strongly developed. Basal antennal segment with both black and yellow hairs.

Thorax. Mesonotum and scutellum with all the bristles and hairs black.

Legs. Anterior femora with one or two bristles on the postero-dorsal surface; length of posterior femora about 3.8 times the dorsal-ventral diameter. Posterior femora with the basal swelling more distinct; most of the spines strongly developed, the ventral row consisting of about eight weaker spines, the oblique row partially duplicated basally. Anterior and middle tibiae with the posterior surfaces obscurely dull blackish-brown, the posterior tibiae with a pad of ventral spines of which one forms a *short* terminal tooth-like claw.

Abdomen. The first three tergites with bands of white hairs, the following segments with hairs and bristles black. Eighth sternite densely covered with long black hairs. Upper forceps (ninth tergite) long, but without the tips curving inwards towards one another. Basal part of aedeagus with a small ventral lobe, apex ovate as viewed from above (Figs. 26 and 48).

Holotype: — ♂, CAMEROONS, Bipindi, x.-xii.1896 (*G. Zenker*, Berlin Mus.).

25. *Bactria mediospinosa* Speiser.

1913. *Promachus mediospinosus* Speiser, *Deutsch. Ent. Zeit.*, **1913**: 141-2.

1920. *Promachus mediospinosus* Ricardo, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 170.

The type of a section of four closely allied species which agree in having a *median* postero-ventral group of spines on the posterior femora of the males. The species are best distinguished by the structure of the aedeagus.

♂ ♀. Length of body 23-27.5 mm., of wing 16-18 mm.

♂. *Head.* Mystax usually wholly golden-yellow; lateralia with the bristles black or yellow or with both intermixed. Palps dorsally and distally with black bristles, baso-ventrally with yellow bristles; sometimes with all the basal bristles yellow and in extreme forms with all of them yellow. Beard golden-yellow. Occiput with the bristles black or yellow or with both intermixed. Frons with black hairs, in extreme forms with black and yellow hairs intermixed. Third antennal segment a little longer than the basal segment.

Thorax. Mesonotum black with brownish pruinescence at the sides, but without distinct medio-dorsal and latero-dorsal stripes. Hairs black except for a few yellow ones anteriorly and above the wing bases. Scutellar bristles and hairs black and yellow intermixed, in some forms almost wholly yellow, in others with a few white hairs among the black and yellow ones.

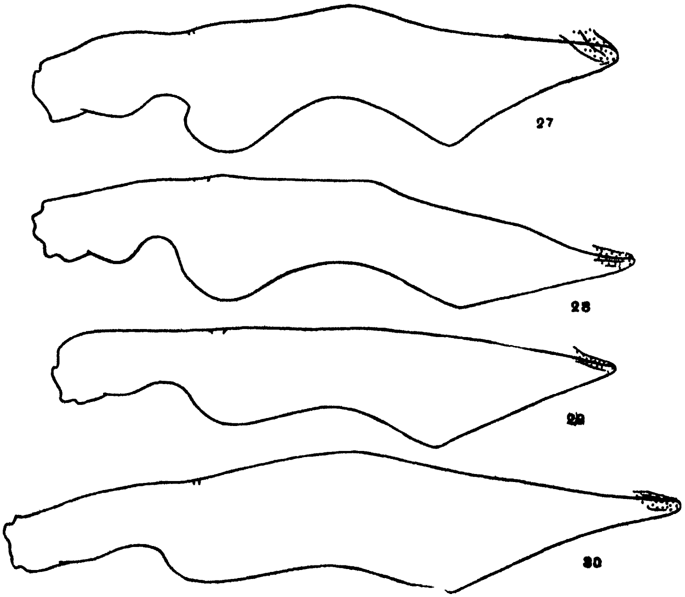
Legs. Almost entirely black, the middle tibiae with dorsal and posterior surfaces dull brownish, the anterior and posterior tibiae sometimes with a trace of very dull brownish colour on the dorsal or posterior surfaces. Some of the hairs black, the remainder golden-yellow. Posterior femora about three-and-a-half times as long as the dorso-ventral diameter, about one-and-a-half times as long as the tibiae; posterior tibiae swollen distally, slightly curved, a little shorter than the tarsi. Anterior femora with one to three postero-dorsal bristles; posterior femora with a slight postero-ventral *median* swelling bearing a group of spines from which there extends a distal and basal row of similar spines along the ventral surface and an oblique row of two to four spines dorsally and distally towards the posterior surface; posterior tibiae with a ventro-distal pad of short spines.

Wings. Smoky, costa with yellow bristles at the base.

Abdomen. Dorsal surface black, at the sides with brownish or yellowish-brown pruinescence. The first segment with a narrow band of yellow hairs, sometimes with a few white hairs; the second and third segments with yellow hairs at the sides and transverse tufts of white hairs on the disc; the four following segments with a band of yellow bristles and hairs at the sides and black bristles on the disc; the eighth segment usually with black bristles and hairs, sometimes with yellow ones; the remaining segments with black bristles and hairs. Ventral surface black; the first seven segments with yellowish-brown pruinescence and golden-yellow hairs and bristles; the eighth sternite truncate, shining black with black hairs and bristles, sometimes with a few yellow ones. Upper forceps (ninth tergite) extending beyond anal (tenth) segment, about two and two-thirds as long as broad; each forcep with a *small* extension on the posterior margin near the base of the anal (tenth) segment. Ninth sternite with a weakly chitinised median area in the distal margin. Aedeagus rather broad and obliquely truncate at the base; distal part short, on each side with a broad lateral flange so that the apex appears broadly pear-shaped as viewed from above; ventral lobe prominent (Figs. 27 and 50.)

♀. Closely resembles the male.

Specimens seen: CAMEROONS: — ♂ holotype, ♀ allotype and 1 ♂ paratype, Duala, x.1913 (*v. Rothkirch, in coll. Dr. P. Speiser*); 1 ♂, Longji (*H. Pasdien,* Berlin Mus.). NIGERIA, 2 ♂♂, Ibadan, Moor Plantation, 12.x.1913 (*W. A. Lamborn,* Hope Dept.).



FIGS. 27—30.—Aedeagus, lateral view. 27, *mediospinosa* Speiser; 28, *speiseri* sp. nov.; 29, *mesacantha* sp. nov.; 30, *mesorrhachis* sp. nov.

26. **Bactria speiseri** sp. nov.

Closely resembles *B. mediospinosa,* but is a little smaller and the yellow bristles and hairs are not so bright. The specimens examined differ also in the following characters: —

♂. Length of body 20-24 mm., of wing 14-16 mm.

♂. *Head.* Mystax with a number of black bristles above and at the sides. Hairs and bristles on the lateralia, palpal bristles (with the exception of a few at the base), the row of occipital bristles, the occipital hairs above this row, and the hairs on the frons black.

Thorax. Scutellar bristles black, the scutellar hairs black and white intermixed.

Legs. Black except for a trace of dull brownish colour on the middle tibiae in some of the specimens.

Abdomen. The first tergite with the hairs entirely white except for a few at the sides which may be yellowish or black; the second and third tergites with the transverse tufts of hair entirely white; the four following segments with nearly all the bristles and hairs black. Ventral surface with some of the hairs black, the remainder white or yellow. Aedeagus with the apex, as viewed from above, not so broadly pear-shaped, basal part narrower, ventral lobe more evenly rounded and less prominent (Figs. 28 and 49).

Holotype :—♂, NIGERIA, Johann-Albrechshöhe, 14.vii.-17.viii. 1896 (*L. Conradt,* Zool. Mus., Berlin). *Paratypes* : — NIGERIA, 1 ♂, Johann-Albrechshöhe, 17.ii.1896 (*L. Conradt*); 1 ♂, Barombi-Stat. (*Preuss*); (Zool. Mus., Berlin). 1 ♂, Barombi (*Lichtwardt*); 2 ♂♂ labelled Kamarun (*L. Conradt*) (Deut. Inst., Berlin).

27. **Bactria mesacantha** sp. nov.

♂. Length of body 16-23 mm., of wing 13-16 mm.

♂. Very closely resembles *B. speiseri*, but differs in having the aedeagus with the latero-distal flange smaller, the apex more uniform in width as viewed from above, the ventral lobe less pronounced and the ninth sternite shorter (Figs. 29 and 51).

Holotype : — NIGERIA, Victoria, vii.1916-viii.1917 (*F. H. Fitz-Roy,* Brit. Mus.). *Paratype* :—LIBERIA, 1 ♂, Ghanga, ix.1926 (*J. Bequaert,* Mus. Congo).

(*To be concluded.*)

A CONTRIBUTION TOWARDS A LIST OF THE AQUATIC COLEOPTERA OF MID-LANCASHIRE.

BY FRANK BALFOUR-BROWNE, M.A. (OXON. ET CANTAB.), F.R.S.E., F.Z.S., F.R.E.S., F.R.M.S.

(formerly Professor of Entomology at the Imperial College of Science, London).

Lancashire, in the Vice-county System (1),* is divided into three parts. The portion north-west of Morecambe Bay is united with Westmorland, while Mid-Lancs. (Lancs. West of Watson (4)) is separated from South Lancs. by the River Ribble. The Westmorland list of water-beetles includes about sixty species of Hydradephaga and Palpicornia but only one or two of these refer to North Lancs. The South Lancs. list runs to about 110 species.

In 1908, the late W. E. Sharp stated that 'nearly the whole of Lancashire north of the Ribble . . .' was 'still virtually unexplored,' and there does not appear to be a single record of Hydradephaga or Palpicornia for that region in his list of Lancashire and Cheshire Coleoptera (3). In a list of the same counties compiled by

H. Britten in 1930 (2), about twenty-five species are added to the water-beetles of the earlier list, but beyond 'L' or 'C,' indicating the county record, no information is given as to locality. We can, however, assume that no further knowledge had been gained of the Mid-Lancs. fauna, since in the Scientific Survey of Blackpool and District, prepared for the British Association Meeting held at Blackpool in September last, among the twenty-four chapters, the only Zoological one is on the Vertebrate fauna, so that, up to date, no one appears to have paid any attention to the Invertebrates of this fairly extensive vice-county which possesses salt-marshes, limited peat areas, many ponds and streams, such as should produce a full list of water-beetle species.

Up to September last, I had a list of eight species for Mid-Lancs. vice-county, six of which were the result of a study, many years ago, of the Reston Collection in the Manchester University Museum and two were from specimens sent me by F. H. Day and the late J. R. Hardy and, so far as I know, there are no published records for this vice-county, and this is the only English division of which this can be said, although three Welsh counties, Brecon, Montgomery and Radnor, are in the same category.

During the British Association Meeting I managed one day to get two or three hours in the field, but, as will be readily understood, collecting in an unknown area is rather of the nature of an exploration than a means for the production of a list of species. Moreover, the early part of September is the end of the barren period, and a fair proportion of the specimens I found were soft and only recently from the pupal cell. However, the list now runs to thirty-two species, as follows:—

Haliplus ruficollis De G.
 ,, *lineolatus* Mannh. (*nomax* B.-B.), Carnforth canal (F. H. Day).
 ,, *lineatocollis* Marsh.
Laccophilus variolosus Herbst (*obscurus* Panz.).
Hyphydrus ovatus Linn.
Hygrotus inaequalis Fab.
Deronectes 12-pustulatus Oliv., R. Lune, Lancaster (Reston Collection).
Oreodytes rivalis Gyll., R. Lune, Lancaster (Reston Collection).
 ,, *septentrionalis* Gyll., R. Lune, Lancaster (Reston Collection).

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* The numbers refer to the bibliography.

Hydroporus dorsalis Fab., Pilling Moss (J. R. Hardy) and near Winmarleigh.
,, *lineatus* Fab.
,, *angustatus* Sturm.
,, *palustris* Linn.
Agabus bipustulatus Linn.
Platambus maculatus Linn., R. Lune (Reston Coll.).
Ilybius ater De G.
,, *obscurus* Marsh.
Colymbetes fuscus Linn.
Dytiscus marginalis Linn.
Hydrobius oblongus Herbst, Morecambe (Reston Coll.).
Philydrus coarctatus Gredl.
Anacaena limbata Fab.
,, ,, *ovata* Reich.
Laccobius bipunctatus Fab. = *alutaceus* Thoms. & Brit. Auct.
Helophorus aquaticus Linn.
,, *viridicollis* Steph.
,, *mulsanti* Rye, Pilling Marsh.
,, *brevipalpis* Bedel.
Henicocerus exsculptus Germ., R. Lune (Reston Coll.).
Octhebius marinus Payk., Pilling Marsh.
,, *impressus* Marsh. = *pygmaeus* Brit. Auct.
,, *bicolon* Germ.
Hydræna riparia Kug.

There must surely be Coleopterists among the members of the Lancashire and Cheshire Entomological Society, and if any of these are stimulated to add to the Vice-county list, I shall be very glad to give what help I can by identifying the species taken.

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3. SHARP, W. E. 1908. The Coleoptera of Lancashire and Cheshire. Third Ann. Rep. & Proc. Lancs. & Cheshire Ent. Soc. 1907 (published 1908).
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Hook Place,
Burgess Hill, Sussex.
October 8th, 1936.

NOTE ON A SPECIMEN OF *PSECTRA* (NEUR.) TAKEN BY DR. F. H. HAINES IN THE NEW FOREST.

BY KENNETH J. MORTON, F.R.E.S.

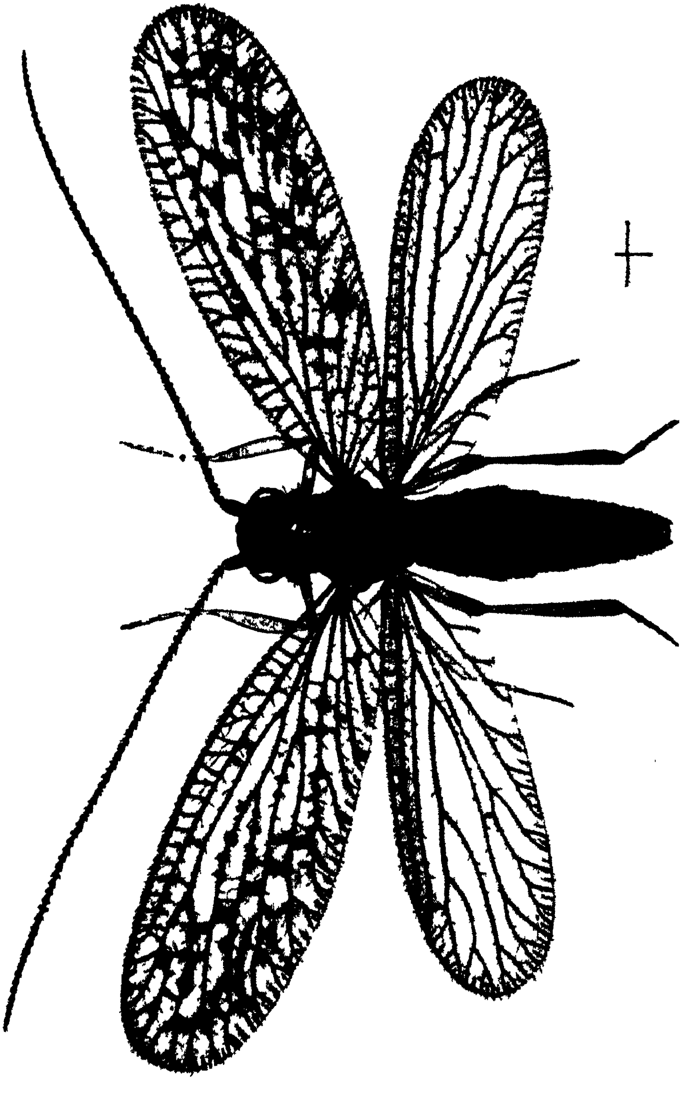
PLATE IV.

Having regard to the mystery that has gathered around the curious little Hemerobiid *Psectra diptera* Burm., on account of its apparent great rarity as a British insect, it is rather remarkable that Mr. H. St. J. Donisthorpe's capture of a specimen at Wicken Fen on 10th September, 1934, should have been followed so soon and in a way been eclipsed by the discovery of a ♂ in the New Forest by Dr. F. H. Haines on 26th July, 1935. This belongs to the form in which all the wings are fully developed, hitherto unrepresented, in this sex at least, amongst the few known British examples. With a rare generosity Dr. Haines has parted with this at present very rare insect, and by the self-denial of Lt.-Col. F. C. Fraser it is now, with Dr. Haines' approval, in my collection. Realising that he had taken an insect of unusual interest, he had carefully set it. Unfortunately the exigencies of study have marred its perfections, but it remains a valued possession. At his request it devolves on me to record the capture.

Naturally Mr. Donisthorpe's capture attracted considerable attention from those who pay attention to the Neuroptera. It was recorded by himself in Ent. Record, Vol. XLVII, p. 13 (1935), where he enumerated the known previous records in the British area. Mr. Kimmins subsequently summarised the existing information about these, noticing the long blank of over thirty years without records and the fact that of the five specimens then known to him at least three had been definitely determined as males (Journal S.B.E., Vol. I, Pt. 3, 1935). All seem to be of the brachypterous 'two-winged' form. Since then I have had the pleasure of receiving from Mr. Killington Vol. I of his long-expected important work on the British Neuroptera in which appears the record of a 'macropterous' female taken by Mr. Burrows at Cark, North Lancashire, on 7th August, 1934, thus a month before Mr. Donisthorpe's.

Mjöberg (Arkiv für Zool. Bd. 6, No. 5, 1909) applied the terms 'two-winged' and 'four-winged' to the two conditions in which this insect appears, and I see no objection to the use of these. His reproductions of wing photographs are instructive. The details of the venation of the anterior wings of his four-winged example do not differ materially from those of the two-winged (and in the absence of any remarks to the contrary I assume the Cark example agrees). In the New Forest male the venation is developed to a

Ent. Mo. Mag., 1936. Plate IV



F. C. Fraser del.

PSECTRA FROM NEW FOREST

greater degree, and I am inclined to suggest that the other two four-winged examples show a tendency to brachypterism. Be that as it may, Mjöberg's census of the recorded examples points to the four-winged form being of much rarer occurrence than the other. He enumerates thirty-eight in all from Europe and of these only eight are four-winged. Of the latter he gives only two males from Sweden and one female from Finland of which the sex had been determined, and one each from Finland, Germany, Holland, Switzerland and Russia (5) of which the sex had not been definitely ascertained. One cannot doubt that the species has since been collected in other countries, with what results I do not know, but probably they have not greatly altered the relative frequency of the two forms.

Mjöberg appears to have established beyond question that the brachypterous 'two-winged' form exists in both sexes; it is perhaps less certain that the same can be said about the four-winged form. He refers to a difficulty in separating the sexes because it frequently happens that the apex of the abdomen is more or less covered with a dry 'Sekrete' (excreta?) obscuring the true structure. So while we find the two four-winged examples from Sweden determined without comment as males, of the two from Finland one is determined as a female with a query, the apex being partially covered with the 'Sekrete,' and the other definitely as a ♀ although also partly covered with the same. He says this is found in most cases only in the female, but the New Forest specimen carried a large blob of the stuff, and although I hazarded the opinion that it was a male, this could only be proved by the removal of the mass by boiling the abdomen in caustic potash.

As it is desirable to give some further details regarding this remarkably interesting addition to the New Forest fauna, I would here acknowledge my great indebtedness to Lt.-Col. Fraser for the help he has so freely given in this connection. With this assistance, explanations of its peculiar features have been made much easier and more satisfactory. The drawings which accompany this note have all been supplied by him. The admirable figure of the whole insect shown on Plate IV has been made from a photograph reduced from a larger painting of the expanded specimen before it reached my hands. After a close scrutiny of the fore-wings, I am satisfied that the complicated venation is correctly shown; considering the relatively small size of the insect and the somewhat convex surface of the wings the accuracy attained is noteworthy. To test the venation of the hind-wings, Mr. W. Parkinson Curtis has very kindly photographed the detached right wing flattened out as far as possible. This brought out some small details in the venation which have been added to the corresponding wing in the figure (a crease or fold in which there is a fracture is shown in the photograph but has not been introduced, in order to avoid confusion with the venation). If Killington and Kimmins' wing-figure (E.M.M., LXVIII, Pl. vi, 1932) and Mjöberg's two figures (*l.c.*) be compared with the New Forest example, although in minor details they differ much, there will be no difficulty in homologising the veins in the left wing at least; in the right not quite so easily, the course of some of the veins being more erratic. In the left the course of the two sectors runs fairly direct to the margin; in the right there are two oblique veins, one in the fork of the proximal sector and one from the upper branch of this sector coalescing with the radius itself at the point where the apical sector leaves the radius, the further course of the apical sector being also irregular. Another noticeable difference is the increased number of cross-veins which tend to form a double, if somewhat irregular, gradate series. The well-developed frenulum should also be mentioned.

1

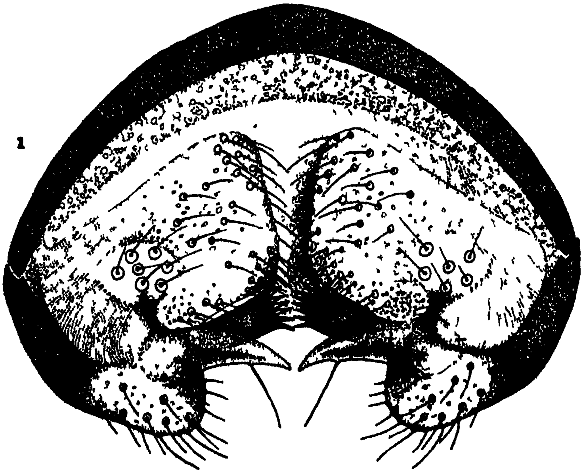


FIG. 1.—Apex of abdomen, postero-dorsal view, somewhat flattened.

A quite successful but rather limp preparation of the apex of the abdomen was made. Unfortunately this was accidentally damaged in my hands before the study was completed. In addition to this preparation and of great use for comparative purposes, there was available a preparation of the genitalia of a ♂ from Finland as well as a series of drawings, also I understand from a

Finnish example, received from Herr Tjeder in December, 1932. As far as I can judge, there is no reason at present for considering that the New Forest example is a different species from these, although one or two details I have been unable to reconcile with Killington and Kimmins' figures, possibly due to the fact that a very slight difference in the position of the object may make a considerable difference in its appearance. With regard to the prominent apical appendage Killington (Mon., p. 248) in his revised figure of the apex of the abdomen, lateral view, follows Tjeder in showing this as pertaining to the 9th tergite. No satisfactory side view could be obtained from my preparation. It may be noted, however, that in attempting to remove the Xth sternite for closer examination, the left anal plate separated from the 9th tergite bringing away with it the apical appendage. The right anal plate with appendage attached remained *in situ* but showing a fracture exactly in the same place where the left appendage had parted from the 9th tergite. The bilateral symmetry of this fracture is curious, and it seems to be indicated in the Finnish preparation also. These fractures may be accidental, but the apical appendage seems to have a firm attachment to the anal plates. Killington states that the aedeagus is absent in *Psectra,* while Tjeder's drawings show a small process which he terms the 'mediuncus'; this process is present in the Finnish preparation and also well developed in the New Forest example. In the latter the parameres show a down-turned tooth in a slightly oblique view; this does not appear in either Killington's or Tjeder's figures and probably in a true

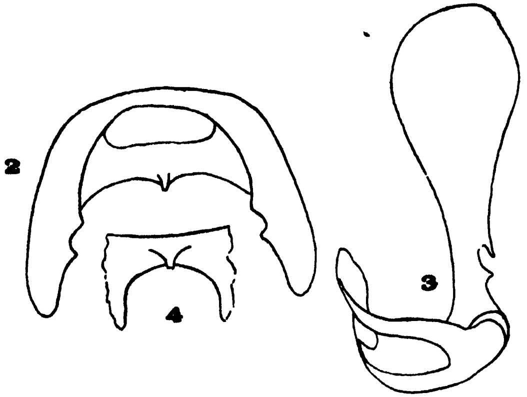


FIG. 2.—Tenth sternite, postero-ventral view.
,, 3.—Parameres of same, lateral, slightly oblique, view.
,, 4.—Part of tenth sternite of ♂ (Finland) showing 'mediuncus.'

lateral view it may look like a chitinous thickening of the margin. These points would require the examination of more material for satisfactory elucidation.

My best thanks are tendered to Herr Bo Tjeder for valuable correspondence and drawings relating to *Psectra*, and to Herr Holger Klingstedt for giving me the great pleasure of examining *Psectra* for the first time.

I may add that Dr. Haines's capture was made in the Linwood neighbourhood; it was beaten from an oak whose low drooping branches touched and in places pressed down the rough growth beneath. Lt.-Col. Fraser has kindly communicated the note which follows, giving an account of the exhaustive but unsuccessful search for the insect made by Dr. Haines and himself during the past summer.

NOTE ON THE SEARCH FOR PSECTRA DIPTERA, BY LT.-COL. F. C. FRASER, I.M.S.

During the present year, from May to September, a prolonged search was carried out by Dr. Haines and myself. The oaks, on one of which last year's specimen was found, were repeatedly gone over, even the upper part of the actual tree being searched. The lower branches of these oaks recline actually on the ground, their ends in places being buried in the grass and surrounding rank herbage, or mingling with neighbouring furze bushes. Thus it is very easy and possible for insects inhabiting low-growing herbage to climb up and find their way into the upper parts of the oaks. I suspect that this is what actually happened in the case of last year's capture.

Our search was carried out very systematically, and every possible habitat, save deep down in the grasses, was probed again and again. One hour would be given to beating furze bushes, another to paying attention to the heather. I myself devoted several hours to beating nettle and thistle beds, and spent several hours on several days beating through sedges and long grasses, which latter rise in places to well above one's head. Bog-myrtle, sallow and young birch trees and bushes were all gone over thoroughly, and young pines growing amidst long grass were not forgotten. Hedgerows, particularly where they bordered on the grassy areas, were beaten; the borders of the neighbouring stream and the adjacent bog were tried, without success. A single *Micromus paganus*, one *M. variegatus*, two *Hemerobius humulinus*, an occasional *Hemerobius micans* and a few *Chrysopa* were all that we came across during this long and arduous search.

With such poor results in the case of the commoner species, and considering the altogether poor season with which the present year has furnished us, it is not to be wondered at that so rare an insect as *Psectra diptera* escaped us. Given a better year we may yet find the habitat of this elusive insect, but it must not be overlooked that this species is probably a crepuscular one like others of the order, and may lie concealed during the day deep in the recesses and roots of grasses and low herbage: if so, the chances of securing it are not too encouraging.

13 Blackford Road, Edinburgh.
October 1*st*, 1936

Systematic Notes upon British Aquatic Coleoptera: *Additional Correction.*—Mr. Donisthorpe and my son have brought to my notice an error not mentioned in the 'errata' published in the June part, p. 126 of this Magazine. In *Hydroporus* I justified the use of the name *morio* for one of the British species and, because Dejean was the first to produce the name, I accredited it to him. He, however, gave no description of the species and the first person to do so after 1821 was Aubé, who, in 1836, gave a full description of Gyllenhal's *melanocephalus*. As *melanocephalus* was preoccupied by Marsham for some other species, apparently not determinable, Gyllenhal's name must go, and as Aubé was the first to redescribe the species after Dejean had renamed it, Aubé must stand as the author.

The specific name in the list of species of *Hydroporus* on p. 254 (November, 1934) should therefore read:—

morio Aubé 1836 p. 307 (Dejean's Cat. 1821)
=*melanocephalus* Gyll. 1808 not Marsham 1802.

I am indebted to my son for looking into the matter for me.—F. Balfour-Browne, Hook Place, Burgess Hill, Sussex: *October*, 1936.

A belated British record of Agelastica alni L.—In 1905 the late Mr. Kidson Taylor asked me to send him my marked list of British Coleoptera. An extract from his letter dated 17.viii.1905 returning the list may be of interest to Coleopterists:—

> 'There is one species marked X *Agelastica alni.* I am particularly interested in this insect, as it is put aside by Beare & Donisthorpe as an introduced insect, and I should much like, if you don't mind, to know *where it was found,* and if you took it yourself or had it sent you by a friend.
>
> Why I ask this is, because the year (1901) before I took up Coleoptera again after a lapse of 25 years, I was on a walking tour through Devonshire & Cornwall, and I happened to find this insect at Marazion near Penzance. Being attracted by this insect in the bright sun on, I think, dwarf young aspens or alders, I just put a *very few,* in fact 10 specimens, into a metal matchbox, the only thing I had with me. As I did not recognise the insect, I sent 2 of these to a friend to ask what it was.
>
> These 10 specimens were all I unfortunately brought away, I could have taken 40 or 50, but this capture started me collecting again. Shall

> I ever take it again? The only records in Fowler's "Brit: Col:" are London, Exeter and Bristol. I have the 8 spp: yet (*and wild horses would not drag them out of me*), as I consider them my "mascot." They certainly induced me to take up the study again, to my intense delight.
>
> So much for my little romance, so you will easily understand my wish to know the data of your insects, I have never seen it in any other Collection.'

I may say that my two specimens were captured at Deal as recorded by Mr. Jennings in this Magazine, Vol. XXXVI (1900), page 161. The only other record I know of, except those given by Fowler, is that of Mr. May from Essex, Vol. LXXI (1935), page 190.

It would be of further interest to learn what has become of Mr. Kidson Taylor's collection, and whether the eight specimens he referred to are still contained therein.—E. C. BEDWELL, 54 Brighton Road, Coulsdon, Surrey: *October 11th,* 1936.

A few Sussex Hemiptera.—On Sunday, July 5th, 1936, I arrived at Broad Oak, a straggling village some two or three miles east of Cripp's Corner on the Rye road and about four miles N.E. of Battle, Sussex.

Here I was to spend a week's holiday and the weather seemed settled and hot. The Monday broke fine, but there was a wind. Almost every day or night there were occasional heavy showers, and the Friday brought a terrific thunderstorm with huge hailstones which battered plants and flattened the crops. The vegetation was thus never really dry for sweeping and beating, but advantage was taken of every likely moment. I was fortunate to find, within five minutes' walk of my host's house, a clearing on a steep slope where the timber—mostly old birches—had been felled two or three years previously and here I worked nearly every day. I believe this land belongs to the Hastings Corporation, for there is a reservoir about a mile south of this part.

In addition to the Hemiptera mentioned below, I took many species of Coleoptera and saw several butterflies, one a fresh *Limenitis sibylla* L. settling on a bramble blossom close to me, while *Enodia hyperanthus* was numerous.

A trip to Camber sandhills, where my father used to collect with the late E. A. Butler nearly 55 years ago, proved very disappointing. First of all we had no sooner left Rye than the rain commenced, and by the time we arrived everything was soaked. Nor did the rain cease for over two hours. Then on the shore we found our movements limited by barbed wire, while what was left of the marram grass was littered with bottles, broken glass and tin cans to make the place one to be shunned.

Except where specially mentioned, all the following were taken at Broad Oak. One *Palomena prasina* L. was taken in the garden off the stem of a marigold, two specimens of *Neottiglossa pusilla* Gmel. were swept up and one *Elasmucha grisea* L. beaten from birch. In both beating-tray and net I found many small Pentatomid larvae, but one seemed to be a nymph, so I kept it in a tin with some lepidopterous larvae. A day or two later it cast its final skin and emerged as *Zicrona coerulea* L. but unfortunately minus the two terminal joints of its antennae which were left behind in the nymphal skin.

Myrmus miriformis Fall. occurred occasionally both at Broad Oak and Camber, while *Chorosoma schillingi* Schill. was at Camber, but mostly immature. A single *Peritrechus geniculatus* Hhn. was swept, as were *Nysius thymi* Wolff and *Scolopostethus affinis* Schill. Other captures included *Piezostethus* *cursitans* Fall. under bark, *Stenotus binotatus* F., *Deraeocoris ruber* L. and *Capsus ater* L.

One specimen only of *Teratocoris saundersi* D. & S. and a small series of *Trigonotylus psammaecolor* Reut. were taken at Camber, which were very wet and suffered consequently before they could be set. *Miris dolobrata* L. was common, but *Dicyphus errans* Wolff proved as elusive as *Campyloneura virgula* H.S., of which I only captured an odd one of each. Three specimens of *Globiceps cruciatus* Reut. were taken, the first being swept from grass by the roadside, between the clearing and the house, and a special effort resulted in two more specimens. They proved later to be one ♂ and one ♀ (developed) and one ♀ (brachypterous). *Heterotoma meriopterum* Scop. was seen on almost every occasion but mostly as a nymph. I took an odd specimen of *Orthocephalus mutabilis* Fall., *O. saltator* Hhn., and *Byrsoptera rufifrons* Fall., several *Phylus palliceps* Fieb. and *P. coryli* L. with the var. *avellanae* Mey. *Amblytylus affinis* Fieb. proved to be the commonest capsid both at Broad Oak and Camber.

Psallus ambiguus Fall. and *P. variabilis* Fall. were met with when beating oaks, but *Atractotomus magnicornis* Fall. was the only Hemipteron beaten from small Scotch pine.

Finally, two hours were spent at Brede, where the river of that name crosses beneath the road at Westfield. In the weeds I found *Gerris gibbifer* Schum. and amidst a host of immaturities one *Corixa geoffroyi* Leach and a pair of *Arctocorisa striata* L.

As usual, my thanks are due to Mr. H. Britten for his kindness in helping me with the more difficult species, including the *Globiceps*.—H. R. P. COLLETT, 'Lauriston,' Park Road, Timperley, Cheshire: *October 14th*, 1936.

Society

ENTOMOLOGICAL CLUB.—A meeting of the Entomological Club was held at 'Woodhouse,' Stroud, on July 29th, 1936, Dr. Harry Eltringham in the Chair. Members present in addition to the Chairman: Mr. H. Willoughby Ellis, Mr. W. J. Kaye. Visitors present: Mr. T. Bainbrigge Fletcher, Dr. Malcolm Burr, Mr. E. B. Ford, Mr. H. W. Holloway, Sir Guy A. K. Marshall, Capt. N. D. Riley.

The party was received by Dr. and Miss Eltringham, and during the morning a tour of the extensive and picturesque gardens was made. The party also inspected the Chairman's Laboratory, which is constructed to secure the best possible light both for general and photographic work. There is a large roof light, the main work bench faces a north light, and the whole of the interior is enamelled white. The principal microscope is a Leitz inclined eyepiece binocular, and there is a Greenhough Binocular for dissection and low power work. The photomicrographic apparatus is provided with a system of distant controls for the mechanical stage, substage condenser, and fine focussing. The removal of air and chloroform vapour during processes of embedding in paraffin and celloidin section-cutting, is effected by a hydraulic air-pump of special design, which registers the degree of vacuum and also controls the rate of readjustment of atmospheric pressure. There is an electric hot plate for mounting sections, melting paraffin and similar purposes. As an annexe to the Laboratory there is a photographic dark room, containing a vertical microprojector for low power drawing, adjustable for both magnification and enlargement, a photographic enlarging apparatus, the usual developing lamps, and a combined clockwork and electric contact printing machine, which can be set to give any desired exposure for contact printing of papers and lantern slides.

Nearly all the apparatus has been designed and constructed by Dr. Eltringham in his own workshop, which is fitted with two electrically driven Hines' lathes, and a full equipment of special tools and appliances.

Luncheon was served at 1 o'clock, after which motor car tours of the wonderful Cotswold district is which ' Woodhouse ' is situated were made. Unfortunately visibility was not sufficiently good to enjoy to the fullest extent the far distant views, in some cases ranging upwards of 40 miles.

The first point was Wallbridge, famous for its cloth mills, then through Stroud up the Slad Valley to Birdlip, where a halt was made at the top of Crickley Hill, giving a fine view over Gloucester and Cheltenham as far as the Malvern Hills. The haze was not quite so dense at this point and a very considerable portion of the expanse was seen. Thence to Cranham Woods through Painswick and the outskirts of Stroud, through Paganhill and Cainscross up the long Selsley Hill and along the extreme edge of the Cotswolds to the top of Frocester Hill, where an amazing panorama right over the whole of the valley of the Severn as far as the mouth of the Bristol Channel and beyond could be seen. Across the river the ' Sugar Loaf ' mountain at Abergavenny can generally be seen 45 miles distant and sometimes the Brecon Beacons still further away. On to Owlpen Manor through Horsley to Nailsworth and Woodchester, passing the Monastery and Nunnery, we returned to ' Woodhouse ' via Lightpill, a marvellous drive.

Those who were able to stay at ' Woodhouse ' the night were further entertained by Dr. and Miss Eltringham, and most pleasant recollections remain of a very happy time.—H. Willoughby Ellis, *Hon. Sec.*

A PRELIMINARY LIST OF THE COLEOPTERA OF WINDSOR FOREST.

BY HORACE ST. J. K. DONISTHORPE, F.Z.S., F.R.E.S., ETC.

(*Continued from p.* 219.)

' The primary aim of science is to explore the facts of Nature, to ascertain their mutual relations, and to arrange them as far as possible into a consistent and intelligible scheme. This endeavour is the true inspiration of scientific work, as success in it is the appropriate reward. The material effects come later, if at all, and often by a very indirect path.'—Horace Lamb.

THE COLEOPTERA OF THE WINDSOR FOREST AREA.

Cicindelidae.

Cicindela campestris L. The common ' Tiger-beetle.' Widely distributed in sandy places. (v, vi, viii.) *

Carabidae.

Cychrus rostratus L. At roots of trees, under boards, logs, and in sand-pits. Widely distributed but not common. (v, vi, vii, ix.)

Carabus catenulatus Scop. Widely distributed and sometimes abundant, on paths, under bark, etc.; 20 in a trench in a sand-pit (7.x.30). (iii, iv, v, viii, x.)

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* The habitats, months of capture, rarity or otherwise, refer only to my Windsor experience.

C. nemoralis Müll. Under boards, on paths; scarce. (v, vi.)

C. violaceus L. Under bark, and at roots of trees, etc.; rarer than *C. catenulatus*. (iv, v, vii, ix, x.)

C. granulatus L. One under piece of wood, x.1923.

C. monilis F. On paths; rare. (vii.)

C. arvensis F. 'Windsor' (Stephens, 1839). Under bark, x.1936 (Allen and Donisthorpe).

Calosoma inquisitor L. 'It was once taken in profusion by Mr. W. Griesbach near Windsor' (Stephens, 1828).

Notiophilus biguttatus F. At roots of trees, on paths, in sand-pits, etc.; common, and widely distributed. (iii, iv, v, vii, viii, ix.)

N. substriatus Waterh. By sweeping, and on paths; local and rare. (vi, viii.)

N. 4-punctatus Dej. In sand-pit; very local and rare. (iv.)

N. aquaticus L. Running on paths and open ground; very local and scarce. (vi.)

N. palustris Duft. In sand-pit, on paths, under cut bracken; local and not common. (iv, vii, ix, x.)

N. rufipes Curt. In dead leaves and running on the ground in beech woods. This handsome species is sometimes abundant. (v, viii, ix, x.)

Leistus spinibarbis F. Common and widely distributed, under bark, in dead leaves, etc. (iii, v, ix, x.)

L. fulvibarbis Dej. Running on grassy path, and in burnt area; decidedly scarce. (v, ix.)

L. ferrugineus L. Not common; under wood-stacks, on logs, on burnt area, sweeping. (vi, viii, ix.)

Nebria brevicollis F. Common, at roots of trees, under logs, etc. The larva throws up casts from its burrows as a bee does. Bred from a larva taken 1.ii, pupated 28.ii, emerged 8.iv. (ii, iii, v, viii, ix, x.)

N. iberica Ol. Very local, but not uncommon under stones in more open sandy country (ix.)

Elaphrus riparius L. Common in marshy places, at edges of ponds, etc. (iv, v, vi, viii.)

E. cupreus Duft. In company with the former; equally common. (iv, vi, viii.)

Loricera pilicornis F. Under dead leaves around ponds, in marshy places, on surface of dried up pools, etc.; common. (v, vi, viii, ix.)

Clivina fossor L. Under stones, in mud of dry stream, in moss, flood refuse, etc.; not common. (iv, v, viii.)

Dyschirius aeneus Dej. On mud around ponds, in reed refuse, etc.; not common. (v, vi, vii, ix.)

D. globosus Hbst. In moss in willow-swamp, in *Sphagnum*; scarce. (v, vii, ix.)

Badister bipustulatus F. In flood refuse, moss, cut grass; one in mole's nest; not common. (iii, v, xii.)

Chlaenius vestitus Payk. On mud around ponds; scarce. (vi, vii.)

C. nigricornis F. On mud around pond; rare. (vi.)

Stenolophus vespertinus Panz. Abundant on mud round ponds, and on surface of dried ponds; by sifting swan's nest, etc. (v, vi, vii, viii, ix.)

Acupalpus flavicollis Sturm. Scarce in reed-refuse. (iii, v, vii.)

A. dorsalis F. In moss; abundant on dry bottom of swamp. (v, viii.)

A. exiguus Dej., v. *luridus* Dej. Common in moss in willow-swamps, sifting swan's and moorhen's nests, on margins of ponds. The typical form has not been found. (iii, iv, v, vi, viii.)

A. brunnipes Sturm. In damp spot near ditch, sweeping and beating faggots in willow-swamp; rare. (v, viii, ix.)

A. meridianus L. Banks of pond, in moorhen's nest, sweeping and beating faggots in willow-swamp; scarce. (v, vi.)

A. consputus Duft. In moss in willow-swamp; rare. (v, vii, x.)

Bradycellus sharpi Joy (*distinctus* Fowler *nec* Dej.). In reed-refuse and in moss; local and not common. (iii, v, x.)

B. verbasci Duft. In moss; abundant by evening sweeping. (iv, viii, x, xi.)

B. harpalinus Dej. In sand-pit, moss, etc., abundant by evening sweeping. (iv, viii, x, xi.)

B. similis Dej. By beating fir tops, evening sweeping, in sand-pits; common. (v, viii, ix.)

Harpalus brevicollis Dej. In cut grass, flood-refuse, etc.; scarce. (i, ix.)

H. puncticollis Payk. By sweeping; rare. (vii.)

H. angusticollis Müll. Sweeping Umbelliferae and grass; locally abundant. (viii.)

H. ruficornis F. On paths, under stones, etc., in sand-pits; common. (v, vi, vii, viii.)

H. aeneus F. Under stones, on paths, in sand-pits, etc.; common. (iv, v, vi, vii.)

H. rubripes Duft. In damp spots, in sand-pits, and on the wing in hot sunshine; not common. (v, vii.)

H. caspius Stev. 'Near Windsor' (Stephens, 1839).

H. latus L. 'Found at Windsor' (Stephens, 1832). On paths and roads, in moss, in sand-pit, and on the wing; not common. (v, vi.)

H. tardus Panz. In cut grass refuse; scarce. (viii.)

H. nigripalpis Steph. 'Taken near Windsor' (Stephens, 1832). There is no insect under this label in the Stephensian collection; nor is it mentioned in G. R. Waterhouse's catalogue (1858). It was possibly a form of *H. honestus* Duft.

H. honestus Duft. In sand-pit; scarce. (v.)

Anisodactylus binotatus F. Running on paths and roads, in moss in dry pond; local, but not uncommon. (v, vii.)

A. binotatus F., v. *spurcaticornis* Dej. In moss and on roads; scarce. (v.)

A. nemorivagus Duft. Under stones and by sweeping; scarce. (ix.)

A. atricornis Steph. Under stones; scarce. (x.)

Stomis pumicatus Panz. At roots of trees, under logs, etc.; scarce. (vii.)

Pterostichus cupreus L. Under stones, running on grassy paths, in willow-swamp; not common. (iv, v.)

P. coerulescens L. (*versicolor* Fowler). On paths and roads, in sand-pits, etc.; rather common. (v, viii.)

P. lepidus F. Very scarce; one pair *in cop.* in sand-pit (30.v.30).

P. madidus F. In cut-grass, sand-pits, roots of trees, flood-refuse, etc.; common. (iii, iv, v, vi, vii, viii, ix, x.)

P. oblongo-punctatus F. 'Near Windsor. . . . Dr. Leach' (Stephens, 1828). I have never taken this species in Windsor Forest, though I have hunted for it for 15 years, under chips of wood, etc. I believe Stephens' record refers to the following species.

P. angustatus Duft. In sand-pit after a fire had passed over it; under chips near burned stump; abundant running on burnt ground; very local. (v, vi, vii, viii, ix, xi.)

P. niger Schall. Under wood-stacks, fungus dumps, in tree stumps, etc.; common under loose bark. (iv, vi, vii, viii, ix, x.)

P. vulgaris L. In sand-pit and on roads; scarce. (vi, vii, ix.)

P. anthracinus Ill. Under stones in damp spot (10.v.93); I have never been able to find it again.

P. nigrita F. In damp places, in *Sphagnum*, running on mud round ponds; common. (iii, iv, v, vi.)

P. minor Gyll. In dead leaves round pond, in *Sphagnum,* moss in willow swamp, reed refuse, etc.; not uncommon. (iv, v, vi, vii, viii.)

P. strenuus Panz. In flood-refuse, moss, *Sphagnum,* etc.; common. (iv, v, x.)

P. diligens Sturm. In the same habitats as the former and equally common. (iv, v, x.)

P. picimanus Duft. Under stones and at roots of trees; scarce. (iv, v, vii.)

Abax striola F. Under wood-stacks, logs, dead leaves, fungus dumps, etc.; common. (v, vi, vii, viii, ix, x.)

Amara apricaria Sturm. Under boards; scarce. (vii.)

A. aulica Panz. By sweeping thistles in flower, fleabane, under boughs and boards; not common. (vii, viii.)

A. bifrons Gyll. Under stones on sandy ground; local and not common. (ix.)

A. ovata F. On grass stems, on roads; scarce. (v, vi.)

A. similata Gyll. On paths and roads, under boards, beating hawthorn-blossom; abundant by sweeping *Matricaria.* (v, vi, vii, ix.)

A. tibialis Payk. Under stones; scarce. (v.)

A. lunicollis Schiödte. In cut grass, sand-pits, etc.; not common. (iv, v, vii, ix.)

A. famelica Zimm. Running on path; very scarce. (vii.)

A. familiaris Duft. In cut grass, on roads and paths, and in sand-pit; not uncommon. (iv, v, vi, vii, ix.)

A. trivialis Gyll. On roads and paths, under boards, in sand-pits; rather common. (iv, v, vi, vii, viii, ix, x.)

A. communis Panz. On road; very scarce. (v.)

A. continua Thoms. In moss; scarce. (iv.)

A. plebeia Gyll. On paths and roads, under leaves, in moss, in dry ditch, etc.; not very common. (v, vi, viii.)

Calathus cisteloides Panz. On burnt ground, under boards, in loose hay, etc.; not uncommon. (vii, viii, ix.)

C. flavipes Fourc. In sand-pits and under stones; abundant running on burnt ground. (vii, viii, ix.)

C. melanocephalus L. In cut grass, under boards, stones, etc.; not uncommon. (vi, vii, ix.)

Amphigynus piceus Marsh. At roots of trees, in sand-pits, on grassy paths, etc.; rather common. (iii, iv, v, vii, viii.)

Anchomenus angusticollis F. Under bark of trees; by beating dead branches of lime trees; rather common. (iii, iv, vii, viii, ix, xi.)

A. dorsalis Müll. Running on road; scarce. (vii.)

A. albipes F. In flood refuse, willow-swamps, margins of ponds, etc.; very abundant. (iv, v, vi, vii.)

A. oblongus Sturm. In moss and by beating faggots in willow swamp, sifting reed-refuse, etc.; common. (iv, v, vi, ix.)

A. marginatus L. Abundant on mud round pond; very local. (iv, vi.)

A. sexpunctatus L. In damp ditches and marshy places, one on dry heath ground, one in sand-pit; not common. (v, vi, vii.)

A. parumpunctatus F. In damp spots, by sweeping, and on the wing; not common. (v, ix.)

A. viduus Panz. On mud round pond and on mud of dried-up pond; not very common. (vi, vii, viii.)

A. viduus Panz., v. *moestus* Duft. In moss in willow-swamp; scarce. (iv, v.)

A. viduus Panz., v. *emarginatus* Gyll. In moss in willow-swamp; scarce. (ix.)

A. micans Nic. In moss in willow-swamp, and in *Sphagnum*; not uncommon. (iv, v, vi, vii, ix.)

A. scitulus Payk. In moss in willow-swamp; very scarce. (x.)

A. fuliginosus Panz. In *Sphagnum,* roots of grass round ponds, in moss in willow-swamp; common. (iv, vi, ix.)

A. gracilis Gyll. By sweeping reeds, running on mud, in reed refuse, etc.; not common. (v, vi, ix.)

A. thoreyi Dej. In moorhen's nest; not common. (vi.)

A. puellus Dej. In swan's and moorhen's nest, in reed refuse; not uncommon. (v, vi.)

A. quadripunctatus De G. Very local; abundant on burnt ground. (vii, ix.)

Olisthopus rotundatus Payk. Under stones, in sand-pit, on burnt ground, at edges of stream, etc.; not common. (v, vii, viii.)

Bembidion rufescens Guér. By beating faggots in willow-swamp; always by beating dead branches on living trees; not uncommon. (v, vii, viii.)

B. obtusum Sturm. In flood-refuse, at edges of ponds; common in moss in willow-swamp. (v, viii, ix, x, xi.)

B. guttula F. In manure-heap, dead leaves and grass, banks of ponds, moss in flood-refuse; common. (iii, iv, v, vi, ix, x.)

B. mannerheimi Sahlb. In flood-refuse, under dead leaves, in sand-pit, sweeping, etc.; common. (ii, iv, v, ix.)

B. biguttatum F. In moss in willow-swamps, on mud around ponds, etc.; common. (iii, iv, v, ix.)

B. lunulatum Fourc. In damp and marshy places, *Sphagnum,* moss in willow-swamps; very common. (iv, v, vii, viii, ix, x, xi.)

B. clarki Daws. In moss in willow-swamp, and in *Sphagnum*; local. (v, vi, viii, ix, x.)

B. articulatum Panz. On muddy edges of streams and ponds; common. (v, vi, ix.)

B. doris Panz. On borders of streams and edges of ponds; abundant on mud of dried-up pond and in *Sphagnum* swamp; local. (iv, v, vii, viii, ix.)

B. gilvipes Sturm. In moss in willow-swamp; very local and scarce. (v, ix.)

B. lampros Hbst. On paths, edges of ponds, in damp places, sand-pits, etc.; common. (iv, v, vi, viii, ix.)

B. nitidulum Marsh. In sand-pits, on banks of streams and ponds, etc.; rather common. (iv, vi, vii, viii, ix.)

B. 4-guttatum F. On muddy banks of ponds and streams; fairly common. (v, viii.)

B. 4-pustulatum Gyll. In damp places; very local. (v, vi, vii.)

B. 4-maculatum Gyll. In wet moss, running on mud and paths in damp places; not uncommon. (v, vi, viii, ix, x.)

B. concinnum Steph. In sand-pit; very scarce. (ix.)

B. femoratum Sturm. In damp sandy place; scarce. (v.)

B. bruxellense Wesm. In *Sphagnum* and on margins of ponds; not common. (iv, v, vii.)

B. litorale Ol. In marshy places, flood-refuse, on mud, etc.; not uncommon. (v, vii, viii.)

B. flammulatum Clairv. In dead leaves around ponds; abundant on muddy banks of stream, etc. (iv, v, vi, viii.)

B. varium Ol. On mud around pond; scarce. (vii.)

Tachypus flavipes L. On mud around pond, on paths and grassy rides; not uncommon. (iv, vi.)

Trechus micros Hbst. 'Windsor. Dr. Leach' (Stephens, 1828).

T. minutus F. In cut reeds and herbage, at roots of trees, at Cossus tree, in fungi, by sweeping, etc.; common. (iv, viiii, ix, x, xi.)

T. obtusus Er. Under boughs, and at edges of pond; scarce. (v, vii.)

T. secalis Payk. In cut reed refuse; scarce. (viii.)

Patrobus excavatus Payk. Under stones, on mud, in flood-refuse, moss, etc.; not uncommon. (v, viii, ix.)

Cymindis humeralis Fourc. 'Rare . . . Windsor' (Stephens, 1839). There is a specimen in the Stephensian Collection.

Lebia cyanocephala L. 'Out of common broom . . . it has also been taken at Windsor' (Stephens, 1828).

L. crux-minor L. 'I have a male which was captured near Windsor' (Stephens, 1828).

Demetrias atricapillus L. In grass, loose hay, beating dead branches on lime trees, sweeping, etc.; common. (iv, vi, vii, viii, x.)

Dromius linearis Ol. In damp places, at roots of rushes, beating fir tops, hawthorn, faggots, etc.; common. (iv, v, vi, ix, x.)

D. angustatus Brullé. In hawk's nest in some numbers; by beating fir tops, on cut pines; very local. (v, ix.)

D. agilis F. Under bark of various trees, by beating spruce, pines, hawthorn, limes, etc.; rather common. (iii, iv, v, vi, vii, viii, ix, x.)

D. meridionalis Dej. In similar situations to the above, and equally common. I took an aberration with two yellow spots on the elytra, like ab. *bimaculatus* Dej. of *agilis,* under bark at Windsor (4.xi.27). (vi, vii, x, xi.)

(*To be continued.*)

Capture of a macropterous female of Conocephalus dorsalis (*Latr.*).—This Tettigoniid was found commonly on the reeds bordering the New Cut, Waxham, Norfolk, in August, 1935. As I was not collecting Orthoptera I took only a male and a female. The male was of the ordinary brachypterous form, but the female I found difficult to identify, the wings being longer than the tegmina and reaching beyond the end of the ovipositor. Mr. K. H. Chapman, of the British Museum, determined it as the macropterous form of this species, var. *burri* Ebner (1910).

Apparently the only other record of the capture of this form in England is that of two specimens by Mr. W. H. Harwood at Clacton-on-Sea, Essex, in August, 1899 (*vide* Ent. Rec. XII, 1900, pp. 128, 129). This form was unknown elsewhere until 1910, when a female was found near Vienna by Ebner, by whom it was named var. *burri* (Mitth. Naturh. Ver. Univ. Wien, 1910, p. 142, figs. 1, 2). The specimen has been placed in the National Collection at South Kensington.—P. FREEMAN, Imperial College of Science and Technology, South Kensington: *October 21st,* 1936.

ADELOCERA QUERCEA HERBST (COL., ELATERIDAE) ESTABLISHED AS BRITISH.

BY A. A. ALLEN.

This genus and species is practically an addition to our list, as the sole previous record, by J. F. Stephens, though now shown to be true, has, like so many others by the same author, apparently been discredited. It has consequently been omitted from all the later works on our Coleoptera (and even from the lists of doubtfully British species appended to our catalogues), and so it may be desirable to give a detailed description:

Elongate, moderately broad (but of longer and narrower form than *Lacon murinus* L.), rather depressed and subparallel-sided; dull fuscous-brown, darker above than beneath, with the head, the greater part of the thorax, a patch at base of each elytron and a conspicuous transverse fascia before apex, the prothoracic flanks, a patch on each side of the metasternum, and the abdominal segments chiefly towards sides and apex, clothed with thick decumbent shining golden curved scales; the central channel of the thorax and two small spots placed longitudinally on each side of it, and two others placed transversely in the basal elytral patch, more or less denuded; the elytra before and behind the subapical fascia are very thinly sprinkled with scales which differ from the others in being silvery-white and isolated or in small groups. Length 10—14 mm.

The genus *Adelocera* (Latreille, Règn. Anim. ed. 2.iv, 1829, p. 451) belongs to the tribe *Agrypnini,* which is distinguished from other Elateridae by its members having the antennae entirely received in repose into furrows formed by the hollowing out of the prosternal sutures. We now possess as British both the European genera, the other comprising the familiar species *Lacon murinus* L. From the latter genus *Adelocera* differs in having the prosternal furrows open behind and reaching the front coxae, and the third joint of the antennae similar to the fourth, the second alone being small and globular. The species are widely distributed, but occur chiefly in warm countries; the majority live in or under the bark of decayed trees. Six species have been found in Europe. *A. quercea* Herbst (*varia,* auct.) differs from all our other Elateridae in the absence of elytral striae and in general appearance. According to Candèze, it is spread over a large part of Central Europe, but is rare in France and most frequent in Austria.

Up to the present the only British record of this insect was that of a specimen stated by Stephens[*] to have been taken by J. H. Griesbach in Windsor Forest about a century ago, together with several other species which have never been recorded since that time. During September, 1936, I had the good fortune to rediscover the present species in Windsor Forest, where I found a single example in fine condition in the decayed trunk of an oak. Subsequently Mr. Donisthorpe took a second specimen, and a larva (almost certainly that of the *Adelocera*) which we hope to rear from the same tree. Further thorough search has hitherto failed to produce others.

The recapture of this fine beetle, as well as that of many other rare species by Mr. Donisthorpe, originally recorded from Windsor, strongly suggests that these records by the old authors, which have not been generally acknowledged, were genuine, and that

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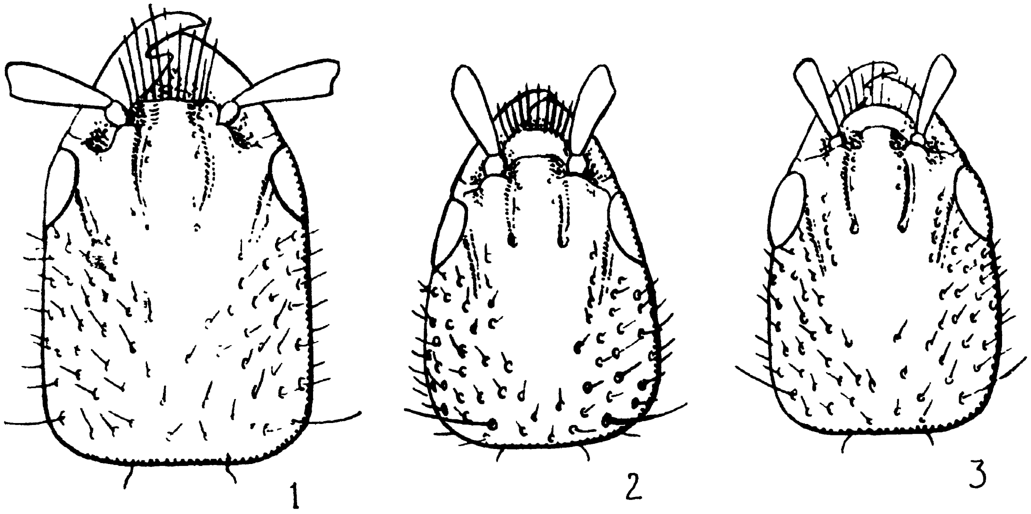
[*] 'I have seen but one specimen, which was taken in Windsor Forest. J. H. Griesbach, Esqre. —Ill. Mand. III, 1830, p. 275.



O. *Tassart del.*

HEADS OF (1) *LEPTACINUS BATYCHRUS* GYLL., (2) *L. LINEARIS* GRAV., (3) *L. INTERMEDIUS* N.SP.

further discoveries of this nature may yet be made in this very interesting locality.

63 Blackheath Park, London, S.E.3.
November 3rd, 1936.

[NOTE.—The generic names *Adelocera* Latr. and *Lacon* Cast. as here used should be transposed, *vide* Hyslop, 1921, Genotypes of Elaterid Beetles; Fleutiaux, Bull. Soc. Ent. France, 1925, p. 205. K.G.B.]

LEPTACINUS INTERMEDIUS N. SP. (COL. STAPHYLINIDAE), A BEETLE NEW TO SCIENCE.

BY HORACE DONISTHORPE, F.Z.S., F.R.E.S., ETC.

PLATE V.

Black, shining, elytra brown, extreme apex and side corners pale yellowish; antennae dark red, first joint sometimes black, legs light brown, knees and tarsi lighter. Head, thorax, scutellum and abdomen alutaceous between the punctures.

Head subtriangular, narrowed to apex, broadest a little before base with rounded posterior angles, straight at base, furnished with a number of shallow setigerous punctures at base and sides; one of these punctures which bears a longer seta is situated on each side of the base of the head near the side margin; eyes large and slightly prominent; antennae with joints 2-3 moniliform, 4-10 transverse, last joint longer than broad, pointed at apex. *Thorax* about as long as head, broadest at anterior angles which are rounded but distinct, narrowed to the rounded posterior angles, furnished with a row of 10-12 punctures on each side of disc, a shorter row running obliquely between these and the side margins, and a cluster of five or six punctures is placed at the anterior angles. *Elytra* longer and broader than thorax, broadest at base, smooth and shining, with rows of rather regular close punctures. *Abdomen* broadest about middle with a number of distinct close punctures on the segments. ♂ with the seventh dorsal segment strongly emarginate, being split to base, with longer hairs at the apex on each side. Long: 4.5 mm.

Described from some thirty specimens taken in a haystack-bottom in Windsor Forest, Nov. 1935, and August, Sept. and Oct. 1936. Type in Coll. Donisthorpe in Brit. Mus.

This species differs from *L. batychrus* in being smaller, with a less parallel-sided head, a lesser number of punctures in the rows on the thorax, and darker-coloured elytra; from *L. linearis* in having a more parallel-sided head, lighter-coloured elytra (these are unicolorous in *linearis*), a larger number of punctures in the rows of the thorax, and with slightly more prominent eyes. In *linearis* the puncture bearing the longer seta is placed nearer to the median line of the head (see Plate V). ♂ with the 7th dorsal segment more deeply cleft than in *linearis* and slightly more so than in *batychrus*. The aedeagus in these species is of an uninteresting vague type and differs little, except in proportion to size, in all three.

On November 12th, 1935, when hunting for beetles in a haystack-bottom in Windsor Forest, a *Leptacinus* was found to occur in some numbers. After studying the species at the Natural History Museum it was seen not to agree with either *L. batychrus* Gyll. or *L. linearis* Gr., but to be intermediate in many respects between them. In the late Dr. Sharp's British collection a good series was found under the label '*linearis* var.' As a matter of fact, except in size, it comes nearer to *batychrus*; as will be seen by the above description, and by the drawings of the heads of the three insects. On further visits to the haystack in question, on November 26th, 1935, and August 25th and September 1st and 29th, 1936, the beetle was again taken. No examples of *L. batychrus* were found, and only one *L. linearis* (on Nov. 26th, 1935) occurred.

Department of Entomology,
British Museum (Natural History).
November 6th, 1936.

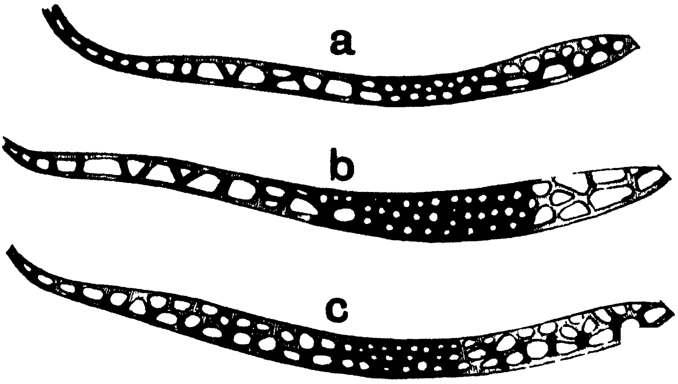
A NEW SPECIES OF THE GENUS *PHYSATOCHEILA* FIEB. (HETEROPTERA: TINGITIDAE) FROM DORSETSHIRE.

BY W. E. CHINA, M.A.

I have recently received from Mr. Philip Harwood a series of an interesting Tingitid which not only proves to be an addition to the British fauna, as supposed by Mr. Harwood, but is actually a new species. Numerous specimens were taken by beating old lichen-covered maples near Witchampton, Dorset, on the 1st of September and at later dates. In general appearance the new species resembles *Physatocheila quadrimaculata* Wolff, but in some respects it approaches *P. dumetorum* H.S. An examination of the genitalia shows that while in general structure, shape of parameres, etc., these three species are very closely allied, they differ in the minute internal structure, particularly in the shape of the conjunctival appendages of the aedeagus. Specimens have been submitted to Prof. C. J. Drake of Iowa, who has evpressed the opinion that they represent a new species, while Mr. E. C. Bedwell and Mr. H. W. Daltry, who also examined the specimens, were of the same opinion. Accordingly I propose to dedicate this new species to Mr. Harwood, who has been instrumental in adding a number of interesting species to the British list. My thanks are due to the above-named gentlemen for their kind collaboration.

Physatocheila* **harwoodi** sp. nov.

Colour: Head rich rust brown, eyes black, lateral and convergent apical spines of vertex pale brownish yellow, depressed median spine rust brown; antenniferous tubercles pale rust brown: first and second antennal segments deep rust brown, third segment pale rust brown, fourth segment black with base rust brown; bucculae sordid white. Pronotum rust brown, becoming paler towards apical (caudal) angle, with the paranota greyish with infuscate reticulations; transverse impression at base of hood black; carinae black with their bases and apices sordid white and their middle on a level with bases of paranota brown. Hemielytra brownish yellow, the costal areas whitish hyaline with the reticulations spotted with black along costal margin, a median dark brown band traversing both elytra widest in middle and narrowing to each costal margin leaving the base and apex of each corium pale; interior marginal vein of membrane distinctly defined and dark brown; interior marginal vein of corium marked with black at apex of pronotum and just before apex of discoidal area, the vein between these two black marks pale yellow as at apex. Legs rust brown with tarsi and claws black.



Costal area of hemielytra of (a) *Physatocheila dumetorum* H.S., (b) *Physatocheila quadrimaculata* Wolff, (c) *Physatocheila harwoodi* sp.nov.

Structure: Third antennal segment relatively longer and more slender than in *quadrimaculata* or *dumetorum;* relative lengths of segments 9, 7, 55, 18. Anterior spines of vertex apically contiguous reaching apices of first antennal segments; lateral spines slender, slightly convergent reaching a little beyond bases of apical spines; median spine short and stout and blunt reaching base of apical spines. Pronotum with disc strongly convex; hood similar to that in *dumetorum* H.S. feebly elevated its anterior margin truncate almost straight, median carina rather indistinct; paranota moderately broad with four rows of cells in widest part, whereas in *quadrimaculata* there are five and in *dumetorum* three; the paranotal cells less distinct and the pronotal carinae less distinctly

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* The emendation *Physatochila*, used by Stal, Horvath, Oshanin, etc., is invalid.

elevated than in above two species. Costal area of hemielytra with two irregular* rows of cells in basal part, three rows in infuscate region and two irregular* rows in apical part except at extreme apex which has one row; sub-costal area (*spatio laterali* of Horvath) with three rows of cells in centre and two rows at base and apex; membrane similar to that in *dumetorum* with a distinct interior marginal vein. Posterior ventral margin of male genital capsule (ninth abdominal segment) rather less truncate and more sinuate in middle than in *dumetorum* and *quadrimaculata;* sensory pits on its dorsal surface in two separate groups without intermediate pits; parameres almost identical with those of above species, conjunctival appendages of aedeagus very short and strongly divergent broad at base and narrowed towards apex.

Total length ♂ and ♀ 3.3 mm.; greatest breadth 1.5 mm.

Habitat:—DORSETSHIRE, Witchampton, numerous specimens on old lichen-covered maples, 1.ix.1936 (P. Harwood).

Resembles a small *P. quadrimaculata* Wolff in general appearance but differs in longer and more slender antennae, more prominent antenniferous tubercles, brown instead of black vertex with spines tinted with pale brown instead of dead white; pronotum more elongate; hood truncate anteriorly instead of distinctly produced in middle and sinuate on each side; reticulations of hood much less distinct, its median carina not prominent nor distinctly seen; paranota narrower and less prominent posteriorly, the reticulations less distinct; pronotal carinae marked with black instead of concolorous; costal area with the number of rows of cells at base, middle, apex and extreme apex respectively 2, 3, 2 and 1, instead of 2, 3, 1 and 1 (see fig.); subcostal area with three instead of four rows. Resembles *P. dumetorum* H.S. in structure and colour of head and pronotum and tegminal membrane, but is a much larger insect with relatively longer and more slender antennae, the costal area with the number of rows of cells at base, middle apex and extreme apex respectively 2, 3, 2 and 1, instead of 2, 2, 1 and 1 (see fig.); subcostal area with three instead of two rows. Differs from the continental *P. confinis* Horv. in larger size, darker colour, broader and less flattened paranota, more truncate anterior margin of hood; and in number of cells in costal area, which in *P. confinis* is 2, 2, 1 and 1, as in *P. dumetorum.* Although subcostal area in both species has three rows of cells, this area is more dilated in *confinis.*

British Museum (Natural History),
Cromwell Road, London, S.W.7.
October 22nd, 1936.

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* Three rows in places in some specimens.

CONOCEPHALUS FUSCUS FAB., A GRASSHOPPER NEW TO BRITAIN.

BY K. G. BLAIR, D.SC., F.R.E.S.,
Department of Entomology, British Museum (Natural History).

In September, 1931, in a patch of reeds near Chale, Isle of Wight, I found a colony of a grasshopper which I took to be *Conocephalus dorsalis* Latr., but all the members of the colony, or at least all those that I took, were of the rare fully-winged form, of which the only British record was a male found by W. H. Harwood near Clacton-on-Sea in 1899.

As *C. dorsalis* they have remained unchallenged in my collection until Mr. K. H. Chapman recently showed me a macropterous female from Norfolk taken by Mr. Freeman, together with continental specimens of *C. fuscus* Fab., and pointed out the difference between them, when it appeared to me that if my memory was correct my captures of five years ago possessed the characters of *fuscus* rather than of *dorsalis*, and this on investigation proved to be the case.

The colour of the two species is different, *C. fuscus* being of a pale bright green, while *C. dorsalis* is of a duller, more waxy green, a difference that is of course more appreciable in life than in dried and discoloured specimens. In *fuscus* the dark reddish mark on the head and prothorax is narrow and subparallel, bordered on each side by a narrow yellow line, whereas in *dorsalis* it is broader and more triangular, widening strongly from apex to base, with the margins much less clearly defined. In the females, moreover, the ovipositor of *fuscus* is long and straight, reaching well beyond the tips of the wings, its actual length, 15 mm., almost as long as the tegmina and longer than the posterior tibiae; but in dorsalis it is shorter (9 mm.), little more than half as long as the tegmina (var. *burri* Ebn.), shorter than the posterior tibiae, and curved rather strongly upwards.

On the Continent *C. fuscus* is much the more plentiful species, widely distributed in Central and Southern Europe, North Africa and across Asia to Amur. *C. dorsalis* is everywhere a rarer and more local insect, being found only in North-western Europe as far east as Austria.

It is true that Curtis (Brit. Ent. I, 1824, No. 82) lists *fusca* Fab. among the British species of *Gryllus* (*i.e.* the long-horned grasshoppers), but as he groups it, with *brachyptera* De G., among the 'species with imperfect elytra and wings' it is obvious that Stephens (Illust. Brit. Ent., Mand. VI, 1835, p. 14) is correct in assuming this to be our *C. dorsalis*, a species which he says he knows Curtis to possess though not mentioned by him. Curtis's specimens should now be in the National Museum, Melbourne.

I am indebted to Dr. Malcolm Burr for kindly confirming the determination of the specimens and for much help with the literature.

British Museum (Natural History).
October 23rd, 1936.

THE ETHIOPIAN SPECIES OF THE *FASCIATA* GROUP OF THE GENUS *BACTRIA* (= *PROMACHUS*) (DIPTERA, ASILIDAE).

BY B. M. HOBBY, M.A., D.PHIL., F.R.E.S., M.S.B.E.
Fellow of The Queen's College, Oxford.
From the Hope Department of Zoology (Entomology), Oxford University Museum.

(*Concluded from p.* 249.)

28. **Bactria mesorrhachis** sp. nov.

1920. *Promachus fasciatus* Ricardo (*partim*), *nec* Fabricius, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 172.

Closely resembles *B. mesacantha*, but distinguished by the longer distal part of the aedeagus and, in the specimens examined, by the following characters :—

♂. Length of body 24-26 mm., of wing 16-18 mm.

♂. *Head.* Mystax usually with a number of black bristles above and on the lateralia, sometimes nearly all the bristles yellow.

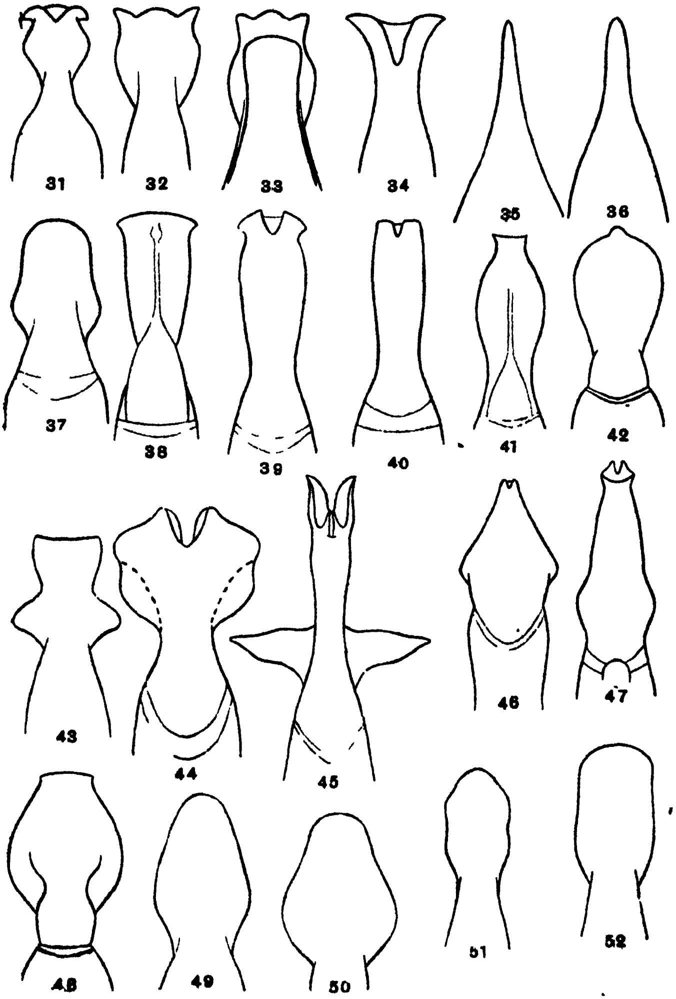
Thorax. Scutellum usually with all the bristles and hairs black, although in the two specimens from Ashanti a few of the hairs are yellow.

Abdomen. The first segment without or with comparatively few white hairs, usually with a large proportion of the hairs black, the remainder mainly yellowish; in the two specimens from Ashanti, however, all the hairs are yellow. These two specimens also have the hairs and bristles at the sides of the first seven tergites yellow, but in specimens from Sierra Leone these segments have many or nearly all of the hairs and bristles black. Aedeagus with distal part longer than that of *B. mediospinosa*, *B. speiseri* and *B. mesacantha*, latero-distal flange small as in *B. mesacantha* and the apex almost parallel sided as viewed from above; ventral lobe not unlike that of *B. mediospinosa*, but less prominent (Figs. 30 and 52).

♀. Resembles the male. Distinguished from the female of *B. fasciata* by the absence of latero-distal tufts of bristles on the eighth abdominal tergite.

Holotype, ♂, and *allotype*, ♀, SIERRA LEONE, Freetown, 14.ix. 1899 and 21.ix. 1899 respectively (*E. E. Austen*). *Paratypes* :— SIERRA LEONE, 1 ♂, Freetown, 15.ix.1899 (*E. E. Austen*). 4 ♂♂ (*W. G. Clements*). 2 ♂♂, 1 ♀, Jarra, 9.ix.1912; 1 ♂, Jowati, 19.viii.1912; 1 ♂, Sembehun, 30.viii.1912; 1 ♂, Kamboma, 11.ix. 1912 (*J. J. Simpson*). 1 ♂ (Hope Dept.). ASHANTI :—1 ♂, Kumasi, 21.x.1907, 'caught in bush on leaf' (*W. M. Graham*). 1 ♂ (Hope Dept.).

Unless otherwise stated, all the above are in the British Museum.



FIGS. 31—52.—Aedeagus, dorsal view of apex. 31, *fasciata* F. (*floccosa* Kirby, *xanthotricha* Bezzi and *niveicincta* sp. nov. are of the same type); 32, *aequalis* Loew; 33, *gossypiata* Speiser; 34, *trichozona* Loew; 35, *acuminata* sp. nov.; 36, *conradti* sp. nov.; 37, *neavei* sp. nov.; 38, *mixta* sp. nov.; 39, *entebbensis* sp. nov.; 40, *crassifemorata* sp. nov.; 41, *carpenteri* sp. nov.; 42, *promiscua* sp. nov.; 43, *erythrosceles* sp. nov.; 44, *rufotibialis* sp. nov.; 45, *calcarata* sp. nov.; 46, *versicolor* sp. nov.; 47, *hastata* sp. nov.; 48, *senkeri* sp. nov.; 49, *speiseri* sp. nov.; 50, *mediospinosa* Speiser; 51, *mesacantha* sp. nov.; 52, *mesorrachis* sp. nov.

SPECIES INCERTAE.

29. *Bactria caffra* Macquart.

1846. *Trupanea caffra* Macquart, Dipt. exot., Suppl. **1**: 79. 40.
1855. *Trupanea caffra* Walker, List Dipt. Brit. Mus., Part 7, Suppl. 3: 596.37.
1860. *Promachus caffer* Loew, Dipt. Fauna Süd-afrika's, **1**: 127.17.
1910. *Promachus caffer* Speiser, Kilimandjaro Meru Exp., **10** (4): 96.

ORIGINAL DESCRIPTION.

'*Nigra. Abdomine basi albo piloso. Mystace flavo. Antennis pedibusque nigris. Alis flavidis.* Long. 10 l. ♂. Voisin du *T. trichonotus.* Wied. Palpes noirs, à poils noirs. Barbe, face et moustache jaunes. Front noir, à léger duvet jaunâtre. Thorax à duvet jaunâtre et bandes noires, presque contigues. Abdomen noir; les deux premiers segments à poils blancs. Pieds à soies et poils jaunâtres. Ailes un peu brunâtres au bord extérieur; première cellule sous-marginale brune, bordée de jaunâtre; nervures comme dans la '*T. Flavifasciata.*

De la Cafrerie. Reçu de M. Delegorgue.'

30. *Bactria robertii* Macquart.

1838. *Trupanea robertii* Macquart, Dipt. Exot., **1** (2): 95.6.
1855. *Trupanea robertii* Walker, List Dipt. Brit. Mus., Part 7, Suppl. 3: 596.38.
1860. *Promachus robertii* Loew, Dipt.-Fauna Südafrika's, **1**: 127.7.
1910. *Promachus roberti* Speiser, Kilimandjaro Meru Exp., **10** (4): 96.
1920. *Promachus robertii* Ricardo, *Ann. Mag. Nat. Hist.*, Ser. 9, **5**: 170.

ORIGINAL DESCRIPTION.

'*Nigra. Capite albo. Abdomine tribus segmentis anticis flavido-pilosis. Tibiis externe castaneis. Alis rufescentibus.* Long. 8 l. ♀.

Thorax (dénudé); côtés à duvet cendré. Hanches, cuisses et jambes à poils blanchâtres en-dessous. Ailes à bande longitudinale grise dans la première cellule sous-marginale. Du Sénégal. M. Robert. Muséum.'

ADDENDUM: THE STATUS OF THE NAMES *TELEJONEURA* RONDANI (1863), *ERAX* SCOPOLI (1763), AND *PROTOPHANES* (LOEW (1860).

Kertész (1909, Cat. Dipt., **4**: 216) places *Telejoneura* Rondani (1863, *Arch. Zool.*, **3**:48) in the synonomy of *Promachus* Loew (1848, *Linn. Ent.*, **3**:390), while Coquillet (1910, *Proc. U.S. Nat. Mus.*, **37**:612) states that *Telejoneura* is a change of name for *Trupanea* Macquart (1838) Dipt. Exot., **1** (2):91), a genus with the same genotype (*Asilus maculatus* Fabricius, 1775) as *Promachus*.

The first use of the name *Telejoneura* makes it clear, however, that it should replace *Trupanea*, not in the same sense in which it was proposed by Macquart, but as conceived by Bigot (1857, *Ann. Soc. Ent. Fr.* (3) **5**: 543). The only species mentioned by Bigot in this connection is *Erax completus* (1838), which under the prior name of *Erax rufibarbis* Macquart (1838) (*sec* J. S. Hine 1919, *Ann. Ent. Soc. Amer.*, **12**: 106 and 137) becomes the genotype of *Telejoneura.*

The genotype of *Erax* Scopoli (1763, Ent. Carn.: 359) is *Erax barbatus* Scopoli (1763) by designation of Coquillet (*op. cit.*: 539).

The genotype of *Protophanes* Loew (1860, Dipt. Fauna Südafrika's, **1**: 143) is *Asilus punctatus* Meigen (1804) (*sec* Engel, 1926, in Lindner, Die Fliegen der Palaearktischen Region, Stuttgart, **24**: 88). *Asilus punctatus* Meigen (1804) is identical with *Asilus punctipennis* Meigen (1820), which was one of the three species placed in the genus *Protophanes* by Loew (*op. cit.*: 145). Although Kertész (*op. cit.*: 273) only doubtfully equated *Erax barbatus* Scopoli (1763) to *Asilus punctatus* Meigen (1820) he was certainly correct in assigning them to the same genus. *Protophanes* Loew is, therefore, a synonym of *Erax* Scopoli.

As pointed out by Hine (*op. cit.*: 103) Macquart (1838, Dipt. Exot., **1** (2): 107) in using *Erax* as a generic name deviated so much from Scopoli's original characterization that an entirely new group of species was admitted. Of these Hine designated *Erax rufibarbis* Macquart (1838) as genotype so that *Telejoneura* is a synonym of *Erax* (*sensu* Macquart) and should be deleted from the synonymy of *Promachus.*

The name *Erax* (*sensu* Macquart) continues to be used by authors in spite of the attempt made by Coquillet (*op. cit.*: 539) to substitute that of *Eicherax* Bigot (*op. cit.*: 545) with genotype *Erax simplex* Macquart (1848) by monotypy. Indeed Hine states 'It is evident therefore, that opportunity for change of generic name is presented, but no action is taken because I am satisfied to use *Erax* in Macquart's sense and thus obviate the changes which another interpretation would involve.' Independent action of this nature is strongly to be condemned while an International Commission on Zoological Nomenclature exists. If Hine's broad conception of the genus is to be followed, the American species so long known by the name of *Erax* may well be referred to *Eichoichemus* Bigot (*op. cit.*: 543) with genotype *Erax flavianalis* Macquart (1848), by monotypy. The application of the name *Erax* to species of the Palaearctic genus *Protophanes* would, however, be unfortunate and is, I believe, a sufficient reason to ask the Inter-

nation Commission to frame an Opinion adding *Protophanes* to the Official List of Generic Names.

Hope Department of Entomology,
University Museum, Oxford.
November, 1936.

Heterocerus rectus Wat. in Kent.—In May, 1935, I took two or three specimens of a *Heterocerus* on a mud-bank in the salt marshes in the Isle of Grain, North Kent; supposing them at the time to be one of the common species, I did not trouble to look for more, which most likely could have been found. Only recently have I discovered that they undoubtedly belonged to the above scarce and little-known species. On subsequent visits to the locality, I have so far been unable to find again the particular mud-bank where it occurred. I believe that this is the first instance of its capture in the South of England, apart from Fowler's doubtful records from Weymouth and Deal; and the only other localities I am aware of are Borth, Cardiganshire (VIII, 27, and VIII, 30, G. H. Ashe) (and see Fowler, Col. Brit. Islands, Vol. III, p. 385, under *H. fossor* Kies., and Vol. V, pp. 461-3, where *H. rectus* is placed as a variety of *H. salinus* Kies.) and Meathop, Westmorland (VI, 29, K. G. Blair). Dr. Joy does not include it in his 'Practical Handbook of British Beetles.'

This species, or variety, is easily recognised by its long, parallel, and rather convex form, the thick light pubescence of the head, and the rather small and very distinct dark yellow marks which are little liable to variation (unlike *H. flexuosus* St.) and are disposed roughly in three bands across the elytra. It is about as long as *H. obsoletus* Curt., but much narrower and less depressed, and with the hind angles of the thorax not margined; it is allied to *flexuosus* St. (*femoralis* Kies.) from which it is readily distinguished by its larger size and much longer shape, the clear red-yellow base of the antennae, the usually different and less extensive light markings, etc. It should be noted that Fowler's description (Vol. III, p. 385) is not of this insect, but of the true *H. fossor* Kies., apparently not a British species.—A. A. ALLEN, 63 Blackheath Park, S.E.3 : *November 9th*, 1936.

Carpophilus sexpustulatus F. in Kent.—On October 18th, 1936, while collecting in a clearing of fir stumps in the Blean Woods near Herne Bay, I found two specimens of *Carpophilus sexpustulatus* F., a beetle which has been regarded as doubtfully indigenous to Britain. Apparently the last capture of this beetle was recorded nearly thirty years ago, in a locality which suggested that it might be indigenous. Six specimens were taken from the carcases of hooded crows near Doncaster (Ent. Mon. Mag., XLIII, 1907, p. 82), and in the previous year two examples were found separately under bark in the same locality (Ent. Mon. Mag., XLII, 1906, p. 179). My own specimens were taken in company with *Ditoma crenata* F. and *Silvanus unidentatus* F. beneath the bark of a small fir stump.

Last year I recorded *Anthicus tobias* Mars. from Mill Hill. This year not a single one has turned up, despite the abundance of this insect in 1935. A diligent search was made on at least six occasions.—K. M. GUICHARD, 60 Birkbeck Road, Mill Hill, N.W.7: *November 9th*, 1936.

[On May 30th, 1913, I took a specimen of *C. sexpustulatus* under spruce-bark in the heart of the Blean Woods, miles away from any buildings (*cf.* Ent. Mon. Mag., Vol. XLIX, p. 160).—J.J.W.]

Agelastica alni L.: another record.—In Mr. Bedwell's interesting note on this beetle (*antea*, p. 257) he gives the reference to Mr. May's record, but there is no mention of the insect on the page he quotes, nor can I find the name in the Index for 1935 or 1934. Mr. A. H. May had, however, presented two specimens to the British Museum and these are labelled 'Essex, Grays, Rainham Distr., A. H. May (about 1868).' There are also six other specimens from the old B.M. collection without data, and seven in the Stephensian collection. There is another record, however. Some years ago a visitor at a meeting of the Entomological Society of London exhibited a number of rare and doubtful British beetles, most of them stated to have been taken near Hindhead; and he added that he had seen *Agelastica alni* in considerable numbers on young alders in the Devil's Punch Bowl on June 26th, 1910. Mr. J. Kidson Taylor also mentions alders as its food-plant, and I found it in abundance on the same tree when I was in Germany, near Crefeld, in 1889. It would seem that this last record might be correct.—HORACE DONISTHORPE, British Museum (Natural History): *November 6th*, 1936.

Tapinostola fulva Hubn. at Sea.—Mr. A. E. Harland, of Scarborough, reports that, while lying at anchor off Portree (east coast of Skye), at least one mile from the shore, on the evening (8 p.m. B.S.T.) of September 2nd, 1936, a large number of moths arrived on board, attracted by the ship's lights. Three rubbed specimens were sent to me, which were identified by Mr. A. Smith, of York, as *Tapinostola fulva* Hübn. The temperature was 65 degrees Fahr. and the atmosphere was sultry and damp, preceding a rain-storm.—GEO. B. WALSH, 22 Stepney Drive, Scarborough: *November 10th*, 1936.

Pachytomella parallela Mey. in Lanarkshire.—In August last I swept from long grass on the edge of a stream near the elevated little town of Leadhills a small black brachypterous bug, which I saw at the time of capture was strange to me, nor after it was set could I name it. Eventually I sent it to Mr. W. E. China, who kindly informed me it was a ♀ *Pachytomella parallela* Mey., and referred me to a paper by the late E. A. Butler in this Magazine (Vol. LX, 1924, p. 12) in which the species was brought forward as British on two ♂ specimens, one from Essex, the other from Dorset. Evidently, the species, although rare, is widely distributed, as Dr. Blair (*l.c.*, Vol. LXVIII, 1932, p. 212) records both sexes from Perthshire, and also mentions the capture of a ♂ near Dublin by Mr. J. N. Halbert.—F. H. DAY, Carlisle: *November 10th*, 1936.

Euscelis bensoni China (Homoptera, Jassidae) in England.—During an expedition to the Perthshire hills in the early summer of 1932, Mr. R. B. Benson collected two specimens of a new species of Jassid which I described under the name *Euscelis bensoni* in the May number of the Entomologist's Monthly Magazine for 1933, p. 107 On June 19th, 1936, Dr. John Smart cautured a single male specimen of this interesting species in Cumberland. It was taken by sweeping coarse grass, etc., near a wood at Hard Knott Pass, 1,290 feet. No doubt this species will prove to be quite widely spread in mountainous and moorland districts in the north.—W. E. CHINA, British Museum (Natural History), London, S.W.7: *October 27th*, 1936.

Obituary.

Lieut.-Col. Richard Milbourne West, D.S.O., O.B.E..—Lieut.-Col. R. M. West, who died on July 19th, 1936, in a nursing home in London, will be greatly missed by all who had the privilege of knowing him.

Col. West was born in Manchester in 1867. On account of his father's delicate health, he was taken at an early age, with the rest of his family, to live at Geneva, Switzerland. His early life was entirely spent in Switzerland, until he came to London to take up his medical studies at St. Bartholomew's Hospital. He followed his medical career for some years in practice at Leicester, but his heart was always in the army, coming as he did from a long line of distinguished soldiers—his grandfather having been one of Wellington's most trusted commanders in the Peninsular War and to the end one of the Iron Duke's greatest friends and companions—his profession being used as a stepping-stone to joining the Royal Army Medical Corps, in which he accepted a commission.

West was a captain when the Great War broke out; he was soon specially selected and appointed to the command of an unit, taking out the 2nd North Midland Field Ambulance, the first territorial division to be sent to the front. He was dangerously wounded at the battle of Loos in September, 1915, whilst establishing an advanced dressing station, being left for dead on the field; fortunately he was brought in just before it was too late, but he never really recovered from his war wounds. After a long sojourn in hospital in England, he rejoined his unit and served until the end of the war in France and Flanders. Twice mentioned in despatches, he was awarded the D.S.O. and O.B.E. for his war services. On retirement he went to live at Wootton Bridge, Isle of Wight. He still continued his activities in ambulance work, being Director of Studies of the Isle of Wight V.A.D.

As an entomologist Col. West was chiefly interested in Coleoptera. He realised that owing to the precarious state of his health his field activities would be severely handicapped, so he confined his attention solely to the Coleoptera of the Isle of Wight; he was fortunate, together with Mr. H. G. Jeffrey, the well-known naturalist of Newport, I.O.W., in being able to add a great many species of Coleoptera to the Isle of Wight list. His collection, which was a fairly extensive one, he bequeathed to the Isle of Wight Natural History Museum at Shanklin.

Col. West, a man of striking appearance and commanding presence, did not often leave his home at Wootton, but he never failed, whenever his health would allow him to do so, to attend 'The Verrall Supper,' a function he much enjoyed and always looked forward to as an opportunity to meet other entomologists.

West was a prominent member of the Isle of Wight Natural History Society, serving on the Council for several years and as President for two years. He was elected a Fellow of the Royal Entomological Society in 1923.

To Mrs. West we beg to extend our deep sympathy in her great loss, which has terminated a happy married life of over forty years.—W.R-S.

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ERRATA.

Page 20, line 10 from bottom, for '*Dalia*' read '*Delia*.'
,, 62, ,, 8, *for* 'pp. 722—730' *read* '429—438.'
,, 62, ,, 14, ,, '263—64' *read* '263—264.'
,, 62, ,, 15, ,, 'Holzwesen' *read* 'Holzwespen.'
,, 85, ,, 5 from bottom, for '*fumipennis*' read '*fuscipennis*.'
,, 86, ,, 12 ,, ,, ,, 'Schaffer' *read* 'Schäffer.'
,, 87, ,, 12, delete brackets; add '*I. violacea*' Tullb.
,, 89, ,, 31, *for* 'Schaffer' *read* 'Schäffer.'
,, 94, ,, 8, ,, 'Monass.' *read* 'Monats.'
,, 175, ,, 2, ,, '*piccus*' read '*piceus*.'
,, 212, ,, 20 from bottom, for '*fungicola*' read '*fagicola*.'
,, 215, ,, 5 ,, ,, ,, 'Know.' *read* 'Konow.'
,, 215, ,, 5 ,, ,, ,, '*meltonatus*' read '*miltonotus*.'
, 215, ,, 4 ,, ,, ,, 'Ktg.' *read* 'Htg.'
,, 226, ,, 3 ,, ,, ,, '*Icidifrons*' read '*Incidifrons*.'

EXPLANATION OF PLATES.

Plate I. British species of *Hoplocampa* (pp. 58—62).
,, II. Development of *Gastrodes abietis* L. (pp. 139—149).
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,, V. Heads of species of *Leptacinus* (pp. 269, 270).

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